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Journeylevel
Advance
Classes

**LTP/1-10
JAC**

LEADERSHIP TRAINING PROGRAM

A JOURNEYLEVEL CARPENTER COURSE FOR
LEADERSHIP PREPAREDNESS TRAINING IN THE
MODERN CONSTRUCTION INDUSTRY

**“THE SUPER SUPER”
MODULE
1 - 10**

CARPENTERS TRAINING COMMITTEE FOR NORTHERN CALIFORNIA (CTCNC)

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LEADERSHIP TRAINING PROGRAM (LTP)

Course Introduction

This course was written to aid the advanced journeyman carpenter or foreman to make the transition from technician to leader. Just as an apprentice needs a training program to better his/her skills as a carpenter, a potential supervisor should be aware of the responsibilities, requirements, and the tools available to meet the obligations of the job of coordinating a construction project from start to finish.

Foremen, general foremen, supervisors, and superintendents have generally come out of the carpenter ranks. This class, and other classes to follow, is intended to pick-up this tradition and provide journeylevel carpenters with a solid foundation in the type of skills required to be successful in these demanding, supervisory positions.

The entire Leadership Training Program (LTP) is designed to be delivered in a series of ten (10), two (2) hour modules. We will attempt to cover the major job tasks of the superintendent required by most contractors. There will be differences in procedures and paperwork, from one contractor to the next, but the basics will remain the same.

If you are here in attendance you have already proven you have the years of experience in the field, the confidence required to lead and the desire to learn the methods used by the construction superintendent to bring a project to a successful completion. Each one of you will be bringing to this class a wealth of knowledge gathered on the job site. Sharing this knowledge with your peers will be an important part of the learning process for all of us.

Upon the completion of all these courses, you should be prepared to take on superintendent responsibilities on your own, however the learning process of being a good superintendent will never end.

Successful completion of all the course modules in this series (as listed in the Global Course Objectives & Module Content) will include a *Leadership Training Program Completion Diploma*.

GLOBAL COURSE OBJECTIVES & INDIVIDUAL MODULE CONTENTS

At the completion of this entire series of modules the participant should have the ability to take a set of contract documents and turn them into a finished project. To do this, the successful superintendent will have to understand the documents, be able to build and administer a schedule, review submittals for compliance, discover and implement change orders, manage the General Contractors' and the sub-contractors' work force, communicate clearly with all parties involved, keep accurate and up to date records, have a working knowledge of other trades, and close the job out - along with posting a profit for the General Contractor.

Following is a comprehensive overview of all the proposed *Leadership Training Program Modules*, along with a brief description of each module's content.

1. Superintendent Responsibilities & Job Site Set-Up

- Course orientation and introduction to responsibilities you will be required to assume

2. Contract Documents

- Significance of all contract documents and their daily applications

3. Change Orders

- Generation, impact, and implementation

4. Submittals

- What they are and how to use them effectively

5. The Schedule

- Bar Charts, Time Line, CPM, time management, setting priorities, etc.

6. Supervising the General Contractors Workforce

- Leadership, motivational techniques, workforce feedback

7. The Daily Diary

- The importance of keeping an organized daily record of events, inspections, deliveries, changes, accidents, weather days, etc.

8. Job Close-Out

- Successful completion of all contractual requirements

9. Review of Trades

- Nuts & bolts of all the trades

10. To Be Determined

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LEADERSHIP TRAINING PROGRAM (LTP)

Module One: Superintendent Responsibilities and Job Site Set-Up

SPECIFIC OBJECTIVES

After completing this module, the participant should be able to:

1. Define the meaning of the job title: Construction Superintendent
2. Outline the responsibilities of the Construction Superintendent.
3. List the obligations required, of the Superintendent, on a daily basis.
4. Know how to set up a job site so that construction may begin.

HAVE THIS STUFF:

Pencil and paper.

EVALUATION

A class evaluation form will be filled out by the students at the end of the session.

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LEADERSHIP TRAINING PROGRAM (LTP)

Module One: Superintendent Responsibilities and Job Site Set-Up

CLASS ACTIVITY GUIDE

Time Allotted	Instructor Activity	Student Activity
15 minutes	Introductions, course material description, course objectives	Registration, fill-out name cards
15 minutes	Lead discussion What is a construction superintendent? Pros and cons of job Job title definition	Discussion participation Take notes
45 minutes	Discuss superintendent responsibilities Record superintendent responsibilities on flip chart Compare chart with responsibility list in Module one	Participate in creating list of superintendent responsibilities Take notes
30 minutes	Discuss job site set up Record job site set up activities on flip chart Compare chart with job site set up list in Module one Discuss past jobs with set up problems	Participate in creating list of job site set up activities and discuss past jobs with job site set up problems Take notes
10 minutes	Answer questions	Open discussion of materials covered, ask questions, take notes
5 min	Conclusion, instructor distributes evaluation forms	Students fill out evaluation forms

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MODULE 1 SUPERINTENDENT RESPONSIBILITIES & JOBSITE SET-UP

THIS MODULE IS PLANNED TO PROVIDE ANSWERS TO THE FOLLOWING QUESTIONS:

- **What are the basic responsibilities of the Superintendent?**
- **What are the legal aspects of the position?**
- **How does a good Superintendent impact the construction process?**
- **What are the basic steps for an efficient jobsite set-up?**

DESCRIPTION OF A TOP CONSTRUCTION SUPERINTENDENT

As the liaison between the general contractor, owner, architect, government agencies, subcontractors, or other interested parties, the superintendent should keep in mind he/she is working for the general contractor. The superintendent is obligated to see a project completed on time and done in a manner that is acceptable to the standards of the industry. The ability of the superintendent to schedule subcontractors, assure job performance, head off potential problems, maximize profits, keep accurate records and maintain communications with all parties involved, are significant factors which affect the cost of the job to the general contractor.

In short, a well managed job should produce a professionally finished project, a satisfied client and a profit for the general contractor.

The successful superintendent must maintain a positive attitude. He or she must be able to lead labor and subcontractors alike. It is important to set the example for a cooperative effort between all involved in the project. He or she must be willing to listen to employees and

subcontractors and able to incorporate good ideas into the methods of construction.

The best superintendents will have the years of experience in the field to recognize the differences between good construction practices and poor ones. They should have strong skills in blueprint reading and scheduling. Accurate record keeping, layout and communication expertise are other necessary attributes. Top superintendents will coordinate the efforts of the architect, owner, general contractor, the labor force, subcontractors and other interested parties, to produce a complete project.

What exactly does the superintendent do when he/she arrives on site?

On a typical site phone messages might be addressed first thing in the morning. Business carried out on the phone might as follows. Check that materials are on the way, see that subs are aware of their commitments, ensure that required inspections are scheduled, a clarify documents with the architect, and communicate with the home office. (Project manager)

The busy super might next meet with the subcontractors working on site. While talking

to the subs the super should ask about and note the subs' manpower on site for that day. Next the super might inspect the work being done. Invariably the super will get asked for clarifications about the contract documents. If the super is sure of the answer it will be readily given. If there is any question about the answer the super will get the information from those described in the contract documents as having the authority to make such a clarification.

An important part of the day might be working with the foreperson of the general contractors own carpentry, or other direct labor, crew. Reviewing and updating the rolling schedule, examining the blueprints to resolve a construction question, discussing manpower requirements and problems, planning upcoming events, etc., these are all items that will need to be coordinated with the foreperson.

Back at the trailer the superintendent will undoubtedly have some phone calls to answer and some calls to make. The superintendent may want to up date the overall schedule for the job site or write R.F.I.s to the architect. There will be correspondence to reply to, submittal reviews to examine and maybe change order information to relay to the project manager. Time cards for direct labor have to be filled out and of course a Diary of the days events will have to be created.

On some days there will be meetings to attend, on the job site and sometimes after the job shuts down at the main office. Safety plans have to be tailored to the jobsite and plans for the next few weeks want to be finalized.

The best superintendents will have the years of experience in the field necessary to recognize the difference between good construction practices and poor ones.

DEFINITION OF CONSTRUCTION SUPERINTENDENT

Legal on site representative of the general contractor.

- He/she can sign documents
- He/she can hire and fire personnel
- He/she can schedule contractors to begin construction
- He/she can rent equipment
- He/she can review and accept, or review and refuse quality of work for compliance with contract documents
- He/she is the supervisor for all safety issues on site

The supervisor for all of the general contractors labor force.

- She/he is the overall labor planner and manager
- She/he will verify time cards
- She/he will set quality control standards
- She/he will carry out the general contractors labor policies

Coordinator of all the elements required to build a successful project.

- He/she will create and administer the schedule
- She/he will coordinate with all interested parties involved in the contract
- He/she will estimate and order materials to arrive at proper time

SUPERINTENDENT JOB RESPONSIBILITIES

The superintendent normally has a list of duties that will have to be performed. Not all of these tasks will be done on a daily basis but the superintendent should be aware of each of these items and how to perform them.

1. Review all contract documents at the start of the project. This review process may start weeks in advance of actual construction. Incorporate all addenda and change orders into working sets of drawings and specs.
2. Build and maintain a working schedule. After schedule is approved per contract documents, distribute copies to all involved in the project.
3. Check on the performance of your subcontractors. This includes assuring that they meet schedule, perform the obligations of their contract in a professional manner and do not illegitimately impede the progress of the other contractors.
4. Maintain an accurate daily report. Carry a pocket diary with you in the field and take notes as required. This will help in writing the daily report. Information should include subcontractors on site, what they are working on and number of men present. It should include job progress or delays, important phone conversations and any unusual occurrences, an accident or an injury for example.
5. Be prepared to attend meetings with architects, owners, government agencies, subcontractors, project manager or other persons involved with the project. Have copies of agenda, minutes of last meeting, daily diaries, copies of correspondence pertinent to topics to be discussed and an up to date working knowledge of the state of the project.
6. Never make any changes to the plans without written approval from those indicated in the contract with the authority to do so. All changes should be reviewed by all subcontractors for possible impact to their cost or schedule. These changes must be coordinated with your project manager.
7. Make arrangements with appropriate agencies for permits or fees. This may be with building, health, water, fire or public works departments. Subcontractors are possibly liable to purchase their own building permits so check contracts with subs for details.
8. Insure that all material to be delivered to the job site is on schedule and is received and inventoried. It must be installed or stored in a protected area. You should sign receipt "Subject to Inventory", if it is inconvenient to count all materials at time of delivery.
9. Maintain a safe and healthy environment in which to work. Schedule and conduct safety meetings. Check that your personnel on site are physically fit and able to perform their jobs. Be prepared to document any injury or accident occurring on your job site.
10. If you suspect any person to be under the influence of drugs or alcohol, enact your company policy.
11. Your personal appearance should be professional and neat. Your trailer should be organized and clean with no pinup calendars or other offensive materials.

JOB SITE SET UP

1. Arrange for temporary trailer or work area. Trailer may require site located on plans and a permit may be necessary.
2. Portable toilet facilities. A temporary john will usually serve 10 workmen one week with regular servicing.
3. Telephone services. Contact local telephone company and arrange for field office phone, fax line or inspectors phone line, as needed.
4. All permits and complete approved plans must be on site before construction starts. You should have one set for as-builts.
5. Water must be provided, for drinking and construction purposes.
6. Temporary power pole location must be spotted by utility company. Temporary power pole may require inspection before the utility company will connect.
7. Arrange for temporary fencing if needed or required. Check plans and specs for notes or details.
8. Move your desk, file cabinets, office supplies, etc. on site as soon as possible. Plan your space for meetings, plans table, storage, office equipment and desk and chairs.
9. Have should have a copy of sub contractor contracts, correspondence, phone numbers, and names of contact persons. Information from architects, engineers, owners, home office, government agencies or other involved parties, should also be filed or stored as needed.
10. Post job sign in approved location. Check plans and specs for details and information required to be displayed.
11. Contact underground service location company for existing utility locations. Do this before any excavation or digging starts.
12. Copies of code books, catalogues or other necessary reference material should be on site.
13. Have a camera to record job starts, differing conditions than noted on plans, progress, or the lack of, job site conditions due to weather or any picture that can clarify a written statement.
14. Post emergency phone numbers. Note address of nearest medical assistance and show clear map for easy location.
15. Provide a first aid kit large enough to serve the crew size. Do not dispense aspirin, cold pills, antacid or other remedies. Have visitor hard hats, fire extinguishers or other safety equipment on site.
16. Post job rules. Hard Hats Required, No Trespassing, No Smoking, etc.
17. Arrange for locking job box or lockable storage shed.

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LEADERSHIP TRAINING PROGRAM

“THE SUPER SUPER”

MODULE TWO: CONTRACT DOCUMENTS

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NOTES:

MODULE 2 CONTRACT DOCUMENTS

THIS MODULE IS PLANNED TO PROVIDE ANSWERS TO THE FOLLOWING QUESTIONS:

- **What are the Contract Documents?**
- **What are the legal aspects of understanding and administering the Contract Documents?**
- **How does a good Superintendent manage these articles?**
- **How do the Contract Documents effect every aspect of the job?**

INTRODUCTION TO CONTRACT DOCUMENTS

Most projects, in today's construction industry, would not be started without a complete set of contract documents. These documents set forth the responsibilities of the owner, the architect, the general contractor, the inspector and or other interested parties. The documents show in pictorial form how the project will look when completed. These documents will give dimensions, they will list material types and grades, they will have door and hardware schedules and they can show substructure and underground systems. The documents might amend, change, add to or delete from earlier documents. Addenda are an example that can change documents during the bidding process. Documents can supply answers to questions about the project or they can clarify drawings.

During the bidding process the different contracting companies will all have the same document package to bid on. After the contract is awarded the documents will change and be added to, as the work progresses. Addenda are an example of the former and Daily Diaries are an example of the latter.

NO SINGLE DOCUMENT MAKES UP THE CONTRACT, BUT RATHER ALL DOCUMENTS AS A WHOLE ARE THE LEGALLY ENFORCEABLE AGREEMENT.

A complete set of documents is required for a comprehensive and accurate estimate of cost. A complete set is required for a plan check with the appropriate permit agencies. A complete set is required to determine if the proposed structure will meet the owners needs and expectations. Of course a complete set is required to provide instructions to build the project. In short, you cannot construct a project without the all the rules and all the directions.

The contract documents are prepared by an architectural team. This team may consist of the:

- *Architect*
- *Structural Engineer*
- *Civil Engineer*
- *Electrical Engineer*
- *Mechanical Engineer*
- *Landscape Architect*
- *Specialty Consultants*

- *Lawyer*

This team will prepare the documents for review by the owner. The architect will design a structure to meet the owners needs. The structural engineer will add design elements that make the building strong enough to meet codes. The civil engineer locates the building on the site, assigns elevations and coordinates utility connections. Electrical and mechanical engineers design the electrical, plumbing, heating and cooling systems. The landscape architect of course designs the exterior planted areas. Specialty consultants and lawyers round out the team. All are coordinated by the architect and all inquiries go through the architect.

When the completed documents are accepted by the owner and appropriate review agencies they are released for bid purposes. If it is a Public Works project there are strict bidding rules and qualifications to meet. If the project is for a private owner the bid may be negotiated.

Should your company be awarded a contract, and the project given to you to oversee in the field, it will be your responsibility to read “every word on every page” of the contract documents. Take a look at the Bound Project Manual provided in the document package. Underline or highlight every statement, detail, drawing etc., that you do not understand or that may conflict with another section or detail. Go through the blueprints and do the same thing.

THE ORIGINAL CONTRACT DOCUMENT PACKAGE

- *Bound Project Manual w/Specifications*
- *Working Drawings*
- *Alternates*

- *Addenda*

BOUND PROJECT MANUAL

FRONT END DOCUMENTS

This section of the documents defines the agreement between the owner, general contractor, project management company, if one is used, and architect. It lists the parties to the contract and their responsibilities. The documents will describe the scope of work, list an agreed upon contract sum and will show a length of time to complete the work. It will define the method of payment, the amount of the payment and timing of the payment by the owner to the general contractor. It may describe testing methods and who administers the testing. The architect will often use a standard form as written by the American Institute of Architects (AIA).

This document is usually broken down into the following administrative elements.

A. STANDARD CONTRACT OF FORMS AND DOCUMENTS

This would contain the signed agreement between the owner and general contractor, performance bond, proof of insurance and escrow agreement.

B. GENERAL CONDITIONS

These are the rules that must be followed in constructing the project. The owner and architect try to anticipate possible events and the resolutions required if they should occur. The conditions define the role of the different parties to the contract and they define what documentation is needed. The General Conditions can consist of the following sections.

1. General Provisions
2. Owner

3. Contractor
 4. Administration of the Contract
 5. Subcontractor
 6. Construction by Owner or by Separate Contractor
 7. Changes in the Work
 8. Time
 9. Payment and Completion
 10. Protection of Persons and Property
 11. Insurance and Bonds
 12. Uncovering and Protection of Work
 13. Miscellaneous Provisions
 14. Termination or Suspension of the Contract
- C. SUPPLEMENTARY CONDITIONS
- These are modifications to the General Conditions. The General Conditions may be a generic standard format. The “Supple-

mentals” refine the documents to encompass the particular projects needs.

D. SPECIAL CONDITIONS

These add to the General Conditions. Some items might be liquidated damages or temporary fencing. The conditions might also be to comply with Equal Employment Opportunity or MBE/WBE (Minority Business Enterprise or Women Business Enterprise) requirements.

Specifications

The specifications are a written description of what materials are acceptable and what quality of construction are required to successfully build the project. The specs detail the quality of the material and the workmanship. Often the specs refer to other sets of standards. The specifications may require that all framing lumber be stamped (Construction Grade). To those not used to reading specifications it can be confusing trying to understand what the architect is asking for.

- **Example One**

The specification concerning millwork may read as follows:

Division 6400

Factory finishing of interior architectural woodwork

- A. General

The primary finishing of interior architectural woodwork required to be performed at factory is work of this section.

- B. Preparations for finishing

Comply with referenced quality standard for sanding, filling counter sunk fasteners, sealing of concealed surfaces and similar preparations for finishing of architectural woodwork, as applicable to each unit of work. Quality standard W.I.C. 25, System #6 (Synthetic Enamels (opaque) Economy Grade)

- **Example Two**

The specs may also specify grades of lumber as follows:

- A. General

Framing shall be Douglas Fir, Coast Region, conforming to West Coast Lumber Inspection Bureau Standard Grading and Dressing, Rule #16.

2x, 3x, 4x, plates, joists, purlins, and beams, number 1 (1500 F-B), Para. 123-b, unless noted otherwise on the drawings.

1. What is the architect saying about the factory finish?
2. What is the referenced quality standard?

Be very careful when reading specifications. On many occasions you will find specs that do not relate to the task or the materials on hand. Do not try to interpret confusing or misleading information on your own. Ask for a clarification from the architect. Many times the plans and the specs will be at odds with each other. The Front End Documents will usually state which takes precedence, plans or specs. If two different grades of material are called out for in the plans and specs, be prepared, there is usually a statement in the General Conditions that the higher grade material is to be used.

The specifications are probably going to appear intimidating the first time you look at them.

They can be as large as a good size book. Take the time to read them and highlight anything that looks like you may need to apply at a later date. There are some architects who simply pull the data out of a manual and don't either really understand the data or know how it applies to the job. It will be to your benefit if you know how they apply.

Keep in mind that you are going to be reading the specifications over the course of constructing the project. This might be for a period of one or more years. After a period of time you will find that you have become more familiar with these contract documents than the person who designed them.

Working Drawings

We commonly refer to these as the plans or the blueprints. Their function is to show in pictures what is being built. The working drawings, in addition to showing dimensions, locations, details and elevations, contain written sections of notes and schedules.

The plans are broken into different sections, usually by major trades. These sections are usually prepared by a team, assembled by the architect, each a specialist in his own field. Most plans contain the following.

A. CIVIL DRAWINGS

These can show the boundary of the property, property elevations, building, sidewalk, curb, driveways, parking, storm sewer and utility locations. Basically these depict the property and improvements to it, and how these relate to the building.

B. ARCHITECTURAL DRAWINGS

These depict the building in its entirety. They will show all dimensions required for the finished product. They show in detail how the building is going to look when the building is completed. They will give exact locations and elevations for built in items. They will show details for finish carpenters. They will give room and building dimensions. They will contain schedules of doors and windows. They will stipulate what color paint, what size, shape and color tile, rug, etc. In short, they show the building from inside and out.

C. PLUMBING DRAWINGS

These obviously show all the plumbing. They give lists of what style, type, size, color, manufacturer, etc. of fixtures. They show location of hot and cold water lines, details for attachment, sewer lines, gas pipe locations and where they connect to existing utilities.

D. MECHANICAL DRAWINGS

These show the heating and cooling systems. They show sizes of pipe, ductwork, vents, fans, etc. They show locations and detail all components and requirements of the system.

E. ELECTRICAL DRAWINGS

These show the entire electrical system. They give all details for wiring, conduit, transformers, switch gear, lights, outlets, etc. They also detail all components and requirements of the system.

F. STRUCTURAL DRAWINGS

These show how the building will be built and with what type and size materials. They will show locations for all structural connections. They will give nailing, bolt, hold down, rebar and concrete details. They show what to use to build the building so that it will not fall down.

G. LANDSCAPE DRAWINGS

These show the planted areas. They show what size, type, color, species, etc. of planting. They also show sprinkler systems. They give depths of soils, amendments, ground cover, etc. They depict the planted exterior.

Reading the Blueprints

One of the superintendent's jobs is to read and understand the plans. This means every word on every page. If you do not know what a particular symbol means ask the architect. You are going to be in charge of the construction and are going to have to insure the coordination of all the subcontractors. Study the plans and check for inconsistencies between sections. Does the Architectural section show the same number of rooftop H.V.A.C. units as the Mechanical section?

You will notice that in the different sections there are notes that refer to other sections. The

plumbers rain water leader attachment details may appear in the Architectural section. The wood curb details your framers need may be in the Mechanical section. General contractors will ask their subcontractors to bid per plans and specs. Each subcontractor gets a complete set of plans and specs. If there is an electricians detail in the Landscaping section, the electrician is responsible to perform to the detail.

Try to locate any problems with the plans and get them resolved before they become critical. There may be gaps in the plans. The mechanical engineer may have left out a cold water make up for the chiller unit. The architect may have left out a roof access. Finding these problems before they create a crisis situation will save the general contractor time and money.

Always remember to compare the information from the blueprints with the information from the other parts of the Contract Documents. Does the spec book ask for Alaskan Yellow Cedar beams and the plans list the beams as Douglas Fir? These kind of discrepancies crop up in every job.

Addenda

These are any changes to the contract documents or the bid documents, issued by the architect, owner or engineer during the bidding period. These addenda can be additions, deletions, modifications or clarification's to the contract documents. When the general contractor submits a bid proposal there must be an acknowledged receipt of all addenda.

The superintendent, when all contracts are signed and he/she is reviewing the documents, should take the addendum and paste them in their appropriate places in the plans and specs. Having these in place will be a good deal easier

than trying to locate a piece of paper months later in the course of building the project.

Addenda can be generated by contractors asking questions of the architect or by the owner deciding to omit a portion of the work. During the review process a fire Marshall may require an additional fire hydrant. If these addenda are issued before the bid, they become part of the bid package and part of the Contract Documents.

Alternates

Alternates are items completely designed and specified in the contract documents, constituting additions or deletions from the base bid, or alternative materials or methods from those shown as base bid items for which the contractor submits separate prices.

An example of this is as follows:

The architect has put together a project to bid on involving building an office complex. The owners have asked that the bids separate the landscaping from the bid package. The landscaping is alternate number one. Alternate number two is for an additional parking structure. In this way the owner can compare costs from the different bidders and spend his money as is in his best interests.

CONTRACTOR NO. 1'S BID PACKAGE

Base Bid	\$1,000,000
Alternate one	\$85,000
Alternate two	\$175,000

CONTRACTOR NO. 2'S BID PACKAGE

Base Bid	\$988,000
Alternate one	\$108,000
Alternate two	\$221,000

If the owner wants the complete project built now, contractor number one is the best choice. If he wants to build the office complex now and hold off on the other work, number two is the logical choice.

ADDITIONAL DOCUMENTS

These are not part of the original document package but are necessary to carry out the provisions of the contract. Sometimes these documents are called out for in the contract documents.

The original contract documents might require a Daily Diary or Log of each days activity while on site. The diary now becomes an additional or peripheral document.

Subcontracts

Few firms would perform all of the work on a construction project with their own manpower. Companies are specialized and will work on particular aspects of the project. An electrical or plumbing contractor will build the work specified by the general contractor in the subcontract agreement. This agreement should clarify exactly what work is to be performed, state all conditions of the contract and stipulate the price the subcontractor will get paid for the work.

A standard form such as the AGC Standard Subcontract Agreement is often used.

Change Orders

These are modifications to the original contract documents, issued in writing by those authorized in the contract documents, after the agreement between the owner and the general contractor has been signed. Change orders can change the scope of work, the contract sum and or the length of the contract.

As stated in other areas, no superintendent should proceed with work that is a change from the original scope of work, without a signed change order. No superintendent should implement solutions to problems in the contract documents no matter how logical they may seem, without a signed change order. No superintendent should sign an extra work order issued by a subcontractor, without having a signed change order from the owner that will cover the work in question. You may find the subcontractor has legitimate cause to ask for an extra work order to perform work that is in the contract documents but that is not in the subcontractors scope of work. The estimator may have missed putting this item in the subcontractors contract so the best course of action is to check with your project manager. There is an entire module based on change orders, so we can cover these in depth at another time.

Submittals

Submittals are information about particular items or methods of construction prepared by subcontractors or suppliers. The submittals must be accepted before installing materials or components on the construction project. They can be a set of shop drawings, actual samples of the product, technical information or a mock up showing quality of construction.

There is a separate module on submittals so we will study their impact in detail in module four.

Schedule

The schedule is the projected plan for the construction project. It is usually broken down into separate tasks and trades, which show a logical progression and interdependency upon each other. It also depicts start and finish dates for the different elements of the project, in

addition it displays the project start and completion dates.

In the Front End Documents there is usually a time of completion specified for the project. There may also be a requirement for a schedule to be produced by the general contractor within a certain period of time after the contract is signed. There may also be a requirement for a specific type of schedule, such as a C.P.M. type, or a specific computer generated schedule such as Primavera®. Producing this schedule may also be a part of the job of the superintendent.

This schedule is important in many ways. It will allow the superintendent to plan on material deliveries, when to start different phases of the job, when to call in each particular sub contractor and to determine if the owner has allowed enough time to complete the project in a reasonable manner.

When a schedule is submitted to the architect and it is reviewed and approved, it becomes part of the contract documents. The sub contractors are required to perform their portions of the work in the time allotted to them and in the sequence shown to them in the schedule. The general contractor is obligated to insure that this schedule is met. We will discuss scheduling in depth in module five so we won't pursue this further at this time.

Standards

Standards are detailed specifications and requirements for a material, test or process. They are written by the agency that regulates or provides standardized specifications or procedures for the product or process.

Some of the standards that are often referenced by the architect might include requirements for concrete, steel doors and frames, framing lumber and finish hardware. The specification

on one project for "Finish Hardware Section 08710" states:

- Provide hardware for fire rated openings in compliance with 1999 CBC, UBC Standard 43-5 and NFPA 80.

Codes

Codes are regulations, ordinances and standards, written or adopted by government and enacted into law. These codes establish minimum requirements for the design and construction of buildings within the jurisdiction of the code, they provide for the safety, health and welfare of the public. Included in the code are provisions which allow for inspection of the construction process.

Group Discussion Questions

1. A question concerning safety on the jobsite is brought up in a meeting with the architect, owner, general contractor and sub contractors. It relates to; Who is responsible for providing barriers and fencing for project site? Where should we look in the documents for the answers?
2. The bound project manual often references other publications for details regarding installation of building materials. Steel door frames, section 08111 contains the following:
 "Install door frames in accordance with ANSI/SDI-100. For fire rated frames NFPA 80."
 What is your responsibility, as the general contractors superintendent, for knowing or providing the information in that document?
3. The plans show a particular red iron bucket in three locations where glu-lams join at the parapet wall. At the fourth location the architect has failed to draw in the detail for the bucket. The glu-lams are the same and the parapet wall details are the same. The

- framing sub contractor states she/he wants an extra for the fourth bucket, if it is required. The architect says the intent of the plans clearly require the bucket as the contractor is responsible for a complete system of framing and structural members. How should you respond to the concerns of the architect?
4. What is the single most important document in a contract with a city building a community hospital?
 5. In what way have you seen contract documents affect a job you were working on? Please list examples of how the documents benefited and how they hindered the project.
 6. Do contract documents change as the project progresses? If yes, In what way? If no, Why not?

This Happened to Me

The general contractor I was working for had submitted the low bid for a new grammar school and was awarded the job. Because I was the superintendent I took the time to review the contract documents before construction started. I noticed a discrepancy in the contract documents. The structural and the architectural drawing details, showing the framing, specified using Douglas fir, #1 grade, for exposed breezeway beams and joists. In fact the blueprints showed using Douglas Fir in 16 separate places. The specification section, in one location, describing the same beams noted using Alaska Yellow Cedar beams. Later that day I found a note in the front-end documents that said “if there are discrepancies in the contract documents specifications will take precedence over plans. I was confused and wrote an R.F.I., {Request for Information}, directed to the architect and asked him how to proceed. He answered that after creating the contract documents, the O.S.A., {Office of the State Architect}, changed the requirements for exposed structural wood to be naturally weather resistant. The architect had added the new requirements to the specifications but had neglected to change the blueprint details. Our company had bid on supplying Douglas Fir lumber, not Alaska Yellow Cedar. We submitted a Change Order Proposal to cover the added cost of the more expensive material.

Questions?

1. Do you think the architect and owner approved the Change Order Proposal request?
2. If your answer is yes, why do you think it was approved?
3. If you think the architect and owner said no, why do you think the request was denied?

THE CONSTRUCTION SPECIFICATION INSTITUTES UNIFORM SYSTEM

Division 1: General Requirements

01010	Summary of Work
01100	Alternatives
01150	Measurement and Payment
01200	Project Meetings
01300	Submittals
01400	Quality Control
01500	Temporary Facilities and Controls
01600	Material and Equipment
01700	Project Closeout

Division 2: Site Work

02010	Subsurface Exploration
02100	Clearing
02110	Demolition
02200	Earthwork
02250	Soil Treatment
02300	Pile Foundations
02350	Caissons
02400	Shoring
02500	Site Drainage
02550	Site Utilities
02600	Paving and Surfacing
02700	Site Improvements
02850	Railroad Work
02900	Marine Work
02950	Tunneling

Division 3: Concrete

03100	Concrete Formwork
03150	Forms
03200	Concrete Reinforcement
03250	Concrete Accessories
03300	Cast in Place Concrete
03350	Specially Finished Concrete
03360	Specially Placed Concrete
03400	Precast Concrete
03500	Cementitious Decks
03600	Grout

Division 4: Masonry

04100	Mortar
04150	Masonry Accessories
04200	Unit Masonry
04400	Stone
04500	Masonry Restoration and Cleaning
04550	Refractories

Division 5: Metals

05100	Structural Metal Framing
05200	Metal Joists
05300	Metal Decking
05400	Lightgauge Metal Framing
05500	Metal Fabrications
05700	Ornamental Metal
05800	Expansion Control

Division 6: Wood and Plastics

06100	Rough Carpentry
06130	Heavy Timber Construction
06150	Trestles
06170	Prefabricated Structural Wood
06200	Finish Carpentry
06300	Wood Treatment
06400	Architectural Woodwork
06500	Prefabricated Structural Plastics
06600	Plastic Fabrications

Division 7: Thermal and Moisture Protection

07100	Waterproofing
07150	Dampproofing
07200	Insulation
07300	Shingles and Roofing Tiles
07400	Preformed Roofing Siding
07500	Membrane Roofing
07550	Traffic Topping
07600	Flashing and Sheet Metal
07800	Roof Accessories
07900	Sealants

Division 8: Doors and Windows

08100	Metal Doors and Frames
08200	Wood and Plastic Doors
08300	Special Doors
08400	Entrances and Storefronts
08500	Metal Windows
08600	Wood and Plastic Windows
08650	Special Windows
08700	Hardware and Specialties
08800	Glazing
08900	Window Walls/Curtain Walls

Division 9: Finishes

09100	Lath and Plaster
09250	Gypsum Wallboard
09300	Tile
09400	Terrazzo
09500	Acoustical Treatment
09540	Ceiling Suspension System
09550	Wood Flooring
09650	Resilient Flooring
09680	Carpeting
09700	Special Flooring
09800	Special Coatings
09900	Painting
09950	Wall Coverings

Division 10: Specialties

10100	Chalkboards and Tackboards
10150	Compartments and Cubicles
10200	Louvers and Vents
10240	Grilles and Screens
10260	Wall and Corner Guards
10270	Access Flooring
10280	Specialty Modules
10290	Pest Control
10300	Fireplaces
10350	Flagpoles
10400	Identifying Devices
10450	Pedestrian Control Devices
10500	Lockers
10530	Protective Covers
10550	Postal Specialties

10600	Partitions
10650	Scales
10670	Storage Shelving
10700	Sun Control Devices (Exterior)
10750	Telephone Enclosures
10800	Toilet and Bath Accessories
10900	Wardrobe Specialties

Division 11: Equipment

11050	Built-In Maintenance Equipment
11100	Bank and Vault Equipment
11150	Commercial Equipment
11170	Checkroom Equipment
11180	Darkroom Equipment
11200	Ecclesiastical Equipment
11300	Educational Equipment
11400	Food Service Equipment
11480	Vending Equipment
11500	Athletic Equipment
11550	Industrial Equipment
11600	Laboratory Equipment
11630	Laundry Equipment
11650	Library Equipment
11700	Medical Equipment
11800	Mortuary Equipment
11830	Musical Equipment
11850	Parking Equipment
11860	Waste Handling Equipment
11870	Loading Dock Equipment
11880	Detention Equipment
11900	Residential Equipment
11970	Theater and Stage Equipment
11990	Registration Equipment

Division 12: Furnishings

12100	Artwork
12300	Cabinets and Storage
12500	Window Treatment
12550	Fabrics
12600	Furniture
12670	Rugs and Mats
12700	Seating
12800	Furnishing Accessories

Division 13:Special Construction

13010 Air Supported Structures
13050 Integrated Assemblies
13100 Audiometric Room
13250 Clean Room
13350 Hyperbaric Room
13400 Incinerators
13440 Instrumentation
13450 Insulated Room
13500 Integrated Ceiling
13540 Nuclear Reactors
13550 Observatory
13600 Prefabricated Structures
13700 Special Purpose Rooms &Structures
13750 Radiation Protection
13770 Sound and Vibration Control
13800 Vaults
13850 Swimming Pools

Division 14:Conveying Systems

14100 Dumbwaiters
14200 Elevators
14300 Hoists and Cranes
14400 Lifts
14500 Material Handling Systems
14570 Turntables
14600 Moving Stairs and Walks
14700 Tube Systems
14800 Powered Scaffolding

Division 15:Mechanical

15010 General Provisions
15050 Basic Materials and Methods
15180 Insulation
15200 Water Supply and Treatment
15300 Waste Water Disposal and Treatment
15400 Plumbing
15500 Fire Protection
15600 Power or Heat Generation
15650 Refrigeration
15700 Liquid Heat Transfer
15800 Air Distribution
15900 Controls and Instrumentation

Division 16:Electrical

16010 General Provision
16100 Basic Materials and Methods
16200 Power Generation
16300 Power Transmission
16400 Service and Distribution
16500 Lighting
16600 Special Systems

FINAL REVIEW

During the time frame of the contract, the superintendent will undoubtedly refer to the contract documents on a daily basis. He/She may need to remind the subcontractor of the grade of lumber required for a window header. The superintendent may have cause to refer to the working drawings to clarify the installation of a seismic brace found in a structural detail. Found in the front end documents will be details on the billing procedure. The superintendent may wish to order materials so as to arrive right before the cut off date.

The contract documents define responsibilities and settle disputes among subcontractors and the general contractor or among owner and the general contractor. If the sub contract for the electrical portion of the work includes section 16500 of the Bound Project Manual, there can be no doubt the electrician is responsible for providing the lighting.

Before a project gets underway on site, the superintendent should familiarize himself with all documents. Any questions about these documents should be brought up at the pre-construction meeting. These questions might pertain to details that do not contain enough information or specifications that do not meet current codes. Perhaps the documents state that a phone and desk must be available for the engineer while that person is on site. Does this mean the engineer gets a separate desk and phone or can he share with the superintendent? Try to get all ambiguities resolved before starting construction. That will prove to be a good deal easier than “putting out fires” as they arise.

NOTES:

CONTRACT DOCUMENT QUESTIONNAIRE

Instructions: This Module Exercise is to be completed by participants broken into groups of 4-5 individuals. Participants are to survey and read the provided “Specifications” and answer the following questions:

1. Who is responsible for supervising safety programs?
2. What type of lumber and what grade is required for 6x10 posts?
3. How often should the General Contractor hold coordination meetings?
4. Who is responsible for paying for the use of temporary power?
5. What temporary facilities is the General Contractor required to provide for the Inspector?
6. Which acceptable Glazed Tile manufacturers are allowed by the Architect?
7. Who is responsible for certifying Prefinished Casework?
8. How long of a time period should you schedule for the initial processing of each submittal?

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LEADERSHIP TRAINING PROGRAM

“THE SUPER SUPER”

MODULE THREE: CHANGE ORDERS

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MODULE 3 CHANGE ORDERS

THIS MODULE IS PLANNED TO PROVIDE ANSWERS TO THE FOLLOWING QUESTIONS:

- **What is an on site occurrence of a change order?**
- **How much paperwork is involved in processing a change order?**
- **What is the impact of a change order?**
- **How do you know who is responsible for the cost of a change order?**

LEADERSHIP TRAINING PROGRAM (LTP)

Module Three: Change Orders

If you are working in construction you have probably dealt with a change order. Typically, if you are a carpenter, you might have completed building a wall and the next thing you know the boss is telling you to tear it down and rebuild it another way. As far as you are concerned your previous work was a waste of your time.

Why do so many change orders occur?

- *Is it because the architects and owners can not make up their minds?*
- *Do these changes slow down your production?*
- *Do the changes cause confusion among the sub-contractors?*
- *How do these changes affect the schedule?*

Like many other types of work, the construction industry has been going through a period of rapid change. Computer assisted bidding programs, rapid mobile

communication and e-mailing are all part of the bidding process. When a project comes up for bid several general contractors will acquire sets of bid documents and investigate whether or not they would like to build the project. If they decide they want to do the work they will seek sub-contractors to bid on various portions of the work. Whatever work the sub-contractors do not perform, the general contractor must hire workers to complete. Many different subs will bid on the same section of work. There may be five electrical contractors seeking the same work for example. These subs will also submit the same bids to the other general contractors. This means that each general contractor has essentially the same prices to do all the work, except for the work the general contractor must perform. The general contractors' work would include offsite project management, onsite job supervision and the direct labor costs of the general contractors own workforce. What this means is that when general contractors are putting together the costs for a ten million dollar project, the dollar value of the general contractors bid, minus the subs work, may be only 10% of the total contract value. Now the general contractor must bid the lowest price possible to get the

work. Large jobs are sometimes bid with only a one or two percent profit margin built in.

This means the contractor must look for profits where ever they can be found. Contractors no longer have the luxury of adding contingency money to the bid to cover unexpected costs. The end result of this is that the estimators must bid per the contract documents and construction superintendents must carefully monitor the job and insure that both he and his subs are not performing work that is not specifically covered in the contract documents.

In contracting for the public sector, the general contractor is required to bid on a project per the bid set of contract documents. The contractor cannot make any assumptions nor can the contractor just arbitrarily add a figure for expected changes. Any changes to the contract document must be paid for by the persons causing the change order. This may mean the contractor has to adjust the cost of the contract down, if the architect removes something. The contractor may propose a cost for additional work if requested. When a bid for a project is accepted, there is usually no more than 1 to 5 percent mark up over cost, and in today's market 5% can be on the high side.

The profit will be realized if there is nothing to slow the job down.

- *All the subs must arrive on site with all the right tools, equipment and manpower to perform to the letter of the contract.*
- *All of the information provided in the contract documents is clear, there are no mistakes or omissions and all required permits are in hand.*
- *All submittals are in, reviewed and accepted, long lead items arrive in time, funding is provided as promised and everyone has their insurance and bonding up to date.*

- *Also it must never rain!*

Request For Information

When a subcontractor or the general contractor discovers conditions other than what was described in the contract documents there are certain steps that should be followed. The superintendent must write an R.F.I. This Request for Information form must be filled out in the form of a question.

For Example

The framing foreperson is busy laying out the walls, doors, window openings, etc. She discovers there is a column right where the plans show a door. The architectural plans on page A3 show the door and on page S2, the structural drawings show the 4" steel column at the intersection of E and #3 lines. The framer wants to know what to do about the door placement. The superintendent needs to fill out an R.F.I. form and send it through company channels to the architect.

The architect has replied to the question in the R.F.I. by stating he would like the door location moved to the north side of column E3. If he elected to delete the door the contractor might have to create a negative change order giving money back to the owner. Moving the door to the north side of the column may not cause any increase in the cost of the contract, but it is best to distribute the R.F.I. and the answer to all subs on the job. Moving the door to the north side of the column might not affect your company but it could affect the plumber for example. If the plumbers drain pipe is to be attached to the column it might interfere with the relocated door. Another R.F.I. asking what to do about the drain pipe would be written and answer could generate an increase in the cost of the contract.

If something is lacking in the plans the superintendent does not invent a solution, that is the job of the architect. The superintendent might make a suggestion to the architect, if it is in the best interest of the contractor. Always get missing information from those responsible for providing it.

You must let the designer establish the complete and correct design, even under the most obvious of circumstances.

Do not assume the responsibilities of your sub contractors. Sub-contractors must coordinate information concerning work they do that affects the work of other subs. For example: The HVAC contractor must give wiring information to the electrician to hook up the air conditioning equipment.

This completed design must be documented in writing by the person responsible.

Always bear in mind that anything that slows the project costs the contractor money. If your sub shows up for work and a discrepancy in the plans prevents him from proceeding, document this situation. Both your company and his may have a legitimate cause to charge for extended general conditions.

- *The contractor is not responsible for performing a complete search of plans and specs, seeking out hidden flaws in the contract, making subsurface explorations or undertaking any other extreme, costly and time consuming investigation. This kind of detailed attention should have been given to the contract documents by the owner and the designer.*
- *A catchall phrase usually found in the form of a stamped statement on the blueprints, such as, “The contractor is responsible for field verifying all*

dimensions and conditions shown on plans for accuracy and dimension.”, does not relieve the owner and architect from paying for discrepancies between plans and actual conditions. The contractor did not create these discrepancies and should not pay for them.

The contractors management team should get a hint as to how accurate and complete plans and specs are by going over them carefully. Are the details paste ups cut out from a book of standardized details? Do the plans say something like, “Refer to specs”, rather than a specific detail or paragraph? Do the plans show different styles of writing and grammar usage? Are the details superfluous, “canned”, or not really related to the specific incidence meant to be shown? All of these examples are indicators of a sloppily prepared project. This of itself can mean a great deal of changes ahead.

Remember, as superintendents, your job is to document changed or unexpected situations not depicted in contract documents. Take pictures or make a drawing. Record important conversations; note the date, the time, who you spoke with, the gist of the conversation and where it took place. Keep your job diary accurate and up to date. See to it that your project manager is aware of these situations or potential problems so that he can start the process of a change order if need be. This may mean the difference between your company turning a profit, staying in business and you staying employed.

Should you discover a situation that you feel will require a change order there are simple procedures that you should follow. Lets look at two different scenarios, one involving a remodel of an existing building, the other involving a new project.

In a remodel or tenant improvement the most common change orders are generated by finding concealed conditions unknown to the designer at the time of his preparing the contract documents. During the design phase the architect will probably not tear down or poke holes in every wall to determine that all conditions are alike. Over the course of many years there may have been several remodels done to the building. Not all of these will have been documented. Your plans may show placing a door in an existing brick wall. Upon opening up the wall an old sewer pipe, still in operation, is discovered running right through the proposed new door location. Your next steps should be as follows.

1. Inform the architect of the situation. This can be done informally with a phone call, but you should fill out a Request For Information form and process it through your company channels immediately.
 2. Document the situation.
 - *Take pictures or make a line drawing showing the pipe, its size, type of material, placement in doorway, etc.*
 - *Make an entry in your daily diary outlining all aspects of the changed conditions.*
 3. Evaluate the situation.
 - *Will this impact your schedule? Has the discovery of this changed condition already cost your company time and money?*
 - *Make an entry in your daily diary outlining all aspects of the changed conditions.*
 4. Wait for written instructions from the architect on how he wishes to proceed. Even if the solution appears to be quick and easy, do not implement any changes without written authorization.
 5. This new drawing should be distributed to all sub contractors. This may be the plumber, the demolition contractor and possibly the door supplier if the architect elects to alter the door size or placement. It may well be a safe policy to inform all subs of all changes. The subs might be affected in ways that you do not figure and may well ask you for a change order down the line.
 6. Depending on your companies' policy, you may not wish to proceed until a cost for the change is established and approved by all parties involved. On many occasions the owner or architect may issue a F.W.A. or Field Work Authorization., and ask that the work continue while a price is being established.
- Now, lets look at a situation where you are constructing a new building and a change occurs. The architect and the owner-user are inspecting the site. They are looking at the framed walls and decide that two separate four foot wide doors are not aesthetically pleasing, they would prefer one large eight foot wide opening with two four foot doors. The architect asks you to stop working on that area and provide a cost for installing the larger door. The following should guide you in proceeding.
7. Evaluate the situation.
 - *If you are running your own framing crew, figure how many man hours it will take to dismantle then rebuild the wall.*
 - *Will it take a special trip to the lumber yard for more material?*
 - *Document all potential costs, including the time you spend figuring out the changed conditions.*
 8. How will this change affect your schedule?
 - *Phone the door sub contractor or door supplier and check on price, availability and lead time required.*
 - *If your schedule is critical and this will cause a delay inform the architect*

immediately.

9. After reviewing the change with your project manager you should wait until you are instructed on how to proceed. It may take a few days for all affected subs to respond to price requests.
 - *Document in your daily diary the fact that the architect asked you to stop work on that door area. If a decision is made to stay with the original drawings you may already have been adversely affected by his stop work request.*
10. Again, proceed with the change only after all the proper paperwork has been processed or your company instructs you to go ahead.

Changes Paid by General Contractor

Until now only change orders between the general contractor and the owner have been discussed. What about changes requested by the sub contractor directed to the general? How and why do these changes occur and what can we as the superintendents do about them?

A good deal of change order requests happen because of the preparation of the contracts between the general and the subs. The sub contractor may delete a certain portion of the work and the general contractors estimators do not cover that portion of it with another sub.

Estimator Error Example

An example may be that the plumber excludes all insulation from his contract obligations and the general contractors estimator agrees. The general estimator assumes that the insulation sub contractor will pick it up or overlooks it. However, the plumbing specs show insulating all hot water pipes. The plumber says he excluded it and the insulator says it is not in his scope of work. Unfortunately they are both right and the general contractor may well end up paying for this mistake. Remember the

phrase “Risk Management”, this is what its all about.

Superintendents Input

The superintendents can be of help in this situation. The project has been awarded to the general contractor and the superintendent is reviewing the plans, specs and contracts of the subs.

- A. The superintendents may pick up on this discrepancy before the job starts. It is usually cheaper to ask for estimates from several subs, ahead of time, than to wait until the task has become critical. This will not save all the money but it can save some and will certainly save some confusion and time later in the project.
- B. Investigate the possibility of performing the work with the general contractors own crew. Compare these costs with those of the subs. The general contractors project manager and superintendents can now make an informed decision.

Invalid Change Orders

“But I didn’t include that portion of the work in my estimate so it’s not fair to ask me to do it. That is why I was cheaper than anyone else.” As a superintendents you are going to hear a version of that story many times from your sub contractors. Because the sub contractors estimator left out a portion of the work in his estimate does not mean the general contractor is going to pay for that mistake.

Another story is, “Framing contractors never provide red-iron buckets for glue-lams.” Because the framer did not read his specs carefully does not mean the general contractor is going to pay for their error. Because the framing contractor does not normally provide red-iron buckets for the glue-lams doesn’t mean it’s not the framers responsibility on this project. In today's construction contracting there is no place for assumptions based on past

practices. Remember, carefully review all subs change order requests against the plans, specs and contracts.

Fortunately all is not lost. Most change orders requested by subs will be legitimate and will be caused by circumstances that are chargeable to the owner. The general contractor will process

these changes and add a percentage of profit and possibly a request for additional time and increased money for general conditions.

Change orders will not make a great deal of money for the general contractor neither should the contractor suffer because they occur.

This Happened to Me

I was working in Oregon as a carpenter on a project remodeling a dental laboratory. We had removed the lab equipment and replaced a wall between two labs. There had been a water leak and over the years most of the studs had become rotten. The electricians installed a new control panel in the wall and the drywallers started to apply the drywall. When we got to the panel we saw it was six inches deep. It was designed for 2x6 walls and we put in 2x4s like the drawings showed. The panel stuck out two inches, so I asked the superintendent what I should do. The superintendent told me to fur out an area around the panel and that would take care of the problem. I did as the superintendent asked me, the sheetrock was completed and everything looked good. About two weeks later the lab equipment, full-length stone countertops, was to be reinstalled. However, we ran into a problem when we tried to fit the tops back in. The furring around the electrical panel prevented the top from fitting in the room. The superintendent submitted a Change Order Proposal to change the countertop so it would fit around the panel. The architect denied the request and the general contractor had to foot the bill for all alterations.

Questions?

1. Why did the architect reject the Change Order Proposal request?
2. What procedure did the superintendent fail to follow?

CHANGE ORDER ESTIMATE

Please list the following:

- | | |
|-----------------------------------------|-------------------------------------------------------|
| 1. Name of Job | 5. Rental or equipment cost |
| 2. Your name | 6. Include time for picking up materials or equipment |
| 3. Materials and cost | 7. Subcontractors costs |
| 4. Labor and cost (list hours of labor) | 8. Overhead and profit (12% of total) |

GENERAL CONTRACTOR - MATERIALS & LABOR DESCRIPTION
TOTAL

SUBCONTRACTORS - COST & DESCRIPTION
TOTAL

PROFIT & OVERHEAD	TOTAL
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GRAND TOTAL _____

QUESTIONS

1. Who is responsible to pay for a change order?
2. What is a Field Work Authorization? What guarantee of payment does it carry?
3. Why are change orders the source for many disagreements in contracting?
4. How can an alert superintendent protect his company from doing work that is not in contract?

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LEADERSHIP TRAINING PROGRAM

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MODULE FOUR: SUBMITTALS

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MODULE 4 SUBMITTALS

THIS MODULE IS PLANNED TO PROVIDE ANSWERS TO THE FOLLOWING QUESTIONS:

- **What is a Submittal?**
- **What are the Superintendents Responsibilities in the Submittal Process?**
- **How can the Superintendent use the Submittal as a Tool?**
- **What different types of Submittals are there?**

LEADERSHIP TRAINING PROGRAM (LTP)

Module Four: Submittals

Submittals are information about or samples of, materials, supplies, equipment, schedules or procedures, requested by the owner or architect of the general contractor. They are provided by the contractor or sub contractor to show specific information. Using the information provided, the architect will determine if the product meets the design intent of the plans and specs. Submittals should be reviewed and accepted by the architect before the superintendent allows the installation of whatever the product or procedure is.

Submittals can be one paragraph on a sheet of paper describing the physical properties of a drywall board. They can be elaborate shop drawings showing all the steel columns and beams in a high-rise. They can also be a sample of the product or a mock up showing the quality of work required to install the product. The contract documents may require an overall schedule of the project be submitted and updated monthly. The superintendent should review the submittal information and check it against the plans and specifications.

The information can be as follows, but this is not a complete list of what submittals contain.

1. Physical Dimensions
 - a. *Pipe size and gauge*
 - b. *Column shape and height*
 - c. *H.V.A.C. unit, length x height*
2. Weight
 - a. *Lbs per foot*
 - b. *Total shipping weight*
 - c. *Installed Weight*
 - d. *Weight empty or full*
3. Color or Finish
 - a. *Painted, primed or bare*
 - b. *Plated, anodized, bronzed, etc.*
 - c. *Texture*
 - d. *Smooth, rough, glossy, matte, etc.*
4. Type of Material
 - a. *Steel, wood, plastic, concrete, etc.*
5. Material Grade
 - a. *Rebar-40 or 60 grade*
 - b. *Wood- #1, Select Structural, Commercial, etc.*

- c. Concrete- Mix design, P.S.I., aggregate size*
- 6. Product Features
 - a. lugs, switches, controls*
 - b. Drains, faucets*
 - c. Screens, filters*
 - d. Connections, tie downs, vibration dampers*
 - e. Water proof or water resistant*
- 7. Strength or Carrying Capacity
 - a. Modulus of elasticity*
 - b. Rated resistance to breaking, ability to support*
 - c. Total gallons, yards, square feet, etc.*
- 8. Requirements to Operate
 - a. Wattage, amperage, voltage*
 - b. Water, coolant, oil, fuel*
 - c. Temperature ranges*
 - d. Exposed or unexposed*
- 9. Special Properties
 - a. R-Factor*
- b. Sound rating, volume*
 - c. Flame spread*
 - d. Stain resistance*
 - e. Wear ability*
- 10. Construction Details
 - a. Type of connections*
 - 1. Bolt sizes*
 - 2. Hanger type*
 - 3. Weld type, size*
 - b. Layout information. templates*
- 11. Product Samples
 - a. Paint brush-outs*
 - b. Brick or tile sample*
 - c. Laminate or glass samples*
 - d. Stucco mock up*
- 12. Manufacturers Literature
 - a. Installation instructions*
 - b. Maintenance requirements*
 - c. Product guarantee*

This Happened to Me

We were building a school in Hollister California. The construction was about eighty percent done. The tile subcontractor has finished in the bathrooms and the plumber was installing fixtures. My schedule showed the partitions going in next, so I called the subcontractor who was to install them. I wanted to give him a warning he was supposed to start the installation the following week. He said he would check his paperwork, as he had not heard from me for over a year. When he called back he asked me if I wanted the submittals sent to the main office or the job site. Immediately I knew I was in trouble. The submittal process takes two to three weeks. Next there is field measurement, manufacture time and then shipping and installation. The partitions were supposed to be installed in one week and I was looking at a process that would take at least six or seven weeks.

Questions?

1. How could I have prevented this problem?
2. Whose fault was this?

The superintendent must read the contract documents and review what is required for each submittal asked for. The spec section that is applicable to the product will list the requirements necessary. Under a separate submittal spec section there may be a description of the process. The superintendent must keep an eye on his schedule and insure that enough time exists for the submittal process to be completed and reviewed before the schedule is impacted.

He must also stay in touch with the sub contractors that have late starts in the project and see that they do not wait until the last moment to submit.

Specs and plans may provide information of what the product must do or withstand, what type it is and even acceptable manufacturers.

For Example

On the UBC Elementary School job the spec section 01340 details the owners requirements for submittals. The owner has requirements for product data, product samples and miscellaneous submittals. These different elements are defined and examples of each are listed. Next the 01340 spec section outlines all procedures to follow when preparing and transmitting submittals to the owner through the architect.

You are looking at the schedule for the job you recently started and see you had better insure submittals for the glue lams are submitted. Before you call the sub who is supplying them look at the glu lam section of the blue specifications book. Before you and the supplier will allow the glu lams to be built you will want to comply with the following requirements for submittals.

SECTION 06170 - GLUED LAMINATED STRUCTURAL UNITS7 **SUBMITTALS:**

8

9 Product Data: Submit manufacturers data, specifications and installation
10 instructions covering lumber, adhesives, fabrication process, preservative
11 treatment, accessories and protection.

12

13 Submit certification, signed by an officer of the manufacturing firm, indicating
14 glued laminated timbers comply with requirements of PS 56.

15

16 Shop Drawings: Submit shop drawings showing full dimensions of each
17 member and layout of entire structural system. Show large scale details of
18 connections, connectors and other accessories. Indicate species and stress
19 grade of lumber, type of glue and other variables in required work.

20

21 Submit certification by treating plant that required treatments comply, etc.

22

23 Shop drawings to be stamped by a structural engineer licenced to practice in
24 the state where the units are fabricated

Where the contract documents call out for a specific submittal the supplier will go to the manufacturer. The manufacturer will supply the product data sheets. These data sheets are reviewed by the architect and accepted or disapproved for general compliance with the plans. The architect may ask for more information than is provided by the data sheets. In this case the supplier may have to return to the manufacturer for more technical data.

Submittals can also be a sample of the product to be used. This can be a paint brush-out, a small section of brick wall, a Formica sample or a piece of tile. If the painter supplies paint brush-outs, he will provide the specified

number called out for in the contract documents. When the architect accepts the brush-outs, he and the owner, the general contractor and the sub contractor all receive an accepted copy of them. After the paint is applied, if there is any question about the color, all concerned can take their accepted copy and compare it with the painted surface.

The superintendent should read or review the submittals and check for compliance with the plans and specs. Today's plans may be prepared by several different persons, all specialists in their own particular fields. The electrical engineer may accept a distribution panel because it fits his design needs. He may be

unaware that his six inch thick panel must fit in a four inch wall. If the superintendent can find problems like this in advance, he or she can save time and trouble later during the course of construction.

Submittals can also alert the superintendent to sequence of construction. If the H.V.A.C unit is too large to fit through standard door openings and it is to be installed in the basement, provisions must be made in the schedule to accommodate placing this unit. Coordination between all sub contractors involved with this is essential.

After reading and or reviewing accepted submittals, the superintendent should file these away in the sub contractors file who submitted them. When the product is delivered check to see it is exactly as is represented in the submittal. This means the same brand name, model number, features, color, etc.

Submittal reviews by the architect do not relieve the contractor of his obligation to insure the product performs to the requirements of the contract documents. Carefully read the stamp the architect places on the submittal. It usually says the architect has reviewed the document for general compliance with the plans. In the case of shop drawings the sub contractor may list a column as being ten feet, eleven inches and build it accordingly. When the column is ready to be installed it is discovered that its correct height is eleven feet, ten inches. A check of the plans show the column should in fact be eleven feet, ten inches tall. The sub contractor is likely to complain that the architect accepted the shop drawings so the architect is responsible for the mistake. This is not the case. The architect will review the shop drawings to check on the grade of steel, the

weld types, the column pipe dimension, but not the height. The column must be as described in the plans.

In some Contract Documents other types of submittals are asked for. These can be a schedule of values for the purpose of billing for the work completed by the Contractor. A schedule of the contractors work or a request to deviate from the schedule provided with the contract documents may be requested as a submittal. On a large project, an architect may even ask for a schedule of the submittals to be submitted.

Contractors Review Stamp

This submittal has been reviewed for general compliance with Contract Documents. No acceptance of substitutions or deviations from the specifications is given or implied by this review unless substitutions or deviations are specifically highlighted in the submittal. Their review does not relieve the Contractor of any contractual obligations nor authorize any changes to the Scope of Work.

Architects Review Stamp

Architects review is for general conformance with the design concept and contract documents. Markings or comments shall not be construed as relieving the Contractor from compliance with the project plans and specifications nor departures therefrom. The Contractor remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions for selecting fabrication processes, for techniques of assembly, and for performing his work in a safe manner.

This Happened to Me

I was the superintendent on a project in Morgan Hill building a retail shopping center. We had completed the framing and the window company arrived on site. They installed the frames and were preparing for the tempered glass delivery. The next day a semi pulled up with sixty thousand dollars worth of glass on it. The installers unloaded the rig and placed the first sheet of glass in a window frame when the building inspector for Morgan Hill stopped by for a routine plumbing inspection. He took one look at the installed glass and came over to me. "You have a problem here", he informed me. "The architectural review board in Morgan Hill has stipulated that all exterior glass in commercial structures is to be bronzed. The glass being installed is obviously clear." I talked to the glass sub contractor and told him of the problem. He said he would review his paperwork and get back to me in the morning. The next day we met at the job site with the inspector and the architect. The glass sub contractor brought in his set of submittals with the architectural review stamps on them. "Look at this, the architect approved these and they say right here that we are supplying clear glass. The architect approved them so he is responsible for the mistake." Next I checked with the inspector about the glass color and he showed me the cover page of our blueprints. Sure as heck there was a sentence written by the plan reviewers from the City of Morgan Hill. It said that all exterior glass was to be bronzed.

It goes without saying that the architect refused to accept any responsibility and he blamed the glass supplier. The architect said, "I think you had better read the wording of the review stamp I put on that submittal. This is clearly the fault of the glass supplier and I want him to install the bronze glass at no extra cost. If there is any delay associated with this glass misorder the glass supplier will pay for it".

Questions?

1. What did the stamp say?
2. Who do you think paid to replace the clear glass with bronzed glass?
3. What could the superintendent do to prevent this type of problem in the future?

J A C

Journeylevel
Advance
Classes

LTP/05

LEADERSHIP TRAINING PROGRAM

“THE SUPER SUPER”

MODULE FIVE: THE SCHEDULE

opeiu-3-af1-cio-211/llr
Revised: 1/16/02/llr

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NOTES:

MODULE 5 THE SCHEDULE

THIS MODULE IS PLANNED TO PROVIDE ANSWERS TO THE FOLLOWING QUESTIONS

- **How to identify and interpret different types of schedules.**
- **How to Administer the schedule.**
- **How to understand the basic requirements of building a successful schedule.**
- **How to solve schedule conflicts and use the schedule as a tool.**

INTRODUCTION TO THE SCHEDULE

The Schedule, by pure definition, is an overall timetable for all the coordinated activities that occur in a particular order during the construction of a particular project.

Perhaps one of your most important tasks as a superintendent is the building and maintaining of the schedule. In today's construction industry, the schedule has become a legal document that can cause change orders, back charges, liquidated damages, etc. It is the overall guide to the sequence for the construction of the project. It allows all involved to plan when materials, personnel, equipment, supplies, etc. should arrive at the job site. Companies are able to forecast when money will be paid to them and funding agencies are able to ascertain when money will be disbursed.

A poorly designed or poorly maintained schedule can and will wreak havoc with owners, suppliers, general and subcontractors. Certain conditions must exist in each schedule for it to be successful.

These conditions are as follows:

COMPONENTS OF THE SCHEDULE

1. There must be a reasonable amount of time allotted to complete the entire job.
2. Each sub-contractor must be given a reasonable amount of time to complete a particular task:
 - *The sub-contractor should expect to be able to maintain a steady manageable crew.*
 - *Subs must be given sufficient time to order materials, tools, equipment, etc.*
3. There must be a logical sequence of events planned:
 - *Site survey first, layout, excavation, rebar, etc. all follow one another.*
 - *Certain tasks can be performed concurrent with each other.*
 - *Electricians may work alongside carpenters and plumbers for example.*
 - *One trade is working on north end of building while another is working on south end and vice versa.*
4. Schedules should include the following:
 - *Start and completion dates for all tasks*

- *Delivery dates of F.O.B. items*
 - *Field measure dates for long lead items*
 - *Allotted time for required inspections?*
 - *Milestones:*
 - *Framing complete*
 - *Rough in plumbing complete etc.*
5. Index of abbreviations
 - *Name and address of project?*
 - *Owner of project?*
 - *Start date and completion date?*
 - *General contractors name*
 6. Dates schedule compiled and updated
 7. Critical path should not exceed twenty five percent of tasks.

TYPES OF SCHEDULES AND TIMETABLES IN CONSTRUCTION

Bar Chart

There are several different formats for schedules. The Bar Chart is perhaps the one most familiar to everyone. At a glance you should be able to tell when each particular task is going to take place. With the schedule graphed out on a calendar scale, start and completion dates are easily understandable. A Bar Chart can also display a time line. That is simply a line through the chart showing a particular date. Using information provided from daily diaries you should be able to determine if the project is on schedule, behind or ahead, as of that date.

Refer to the Bar Chart provided to see how simple schedules can be displayed. Note what information can be displayed and what information cannot.

Critical Path Chart (Critical Path Method - CPM)

A Critical Path Chart shows the logic involved in going from one task to another and how each task relates to others in the schedule. These Critical Path charts can carry a great deal of information. They may show earliest projected start and completion dates, latest possible start and completion dates, the resource (contractor) involved, slack time, task duration and actual finish dates. These schedules can also be cost loaded for ease of billing purposes or projecting income. Today most Critical Path charts are prepared with the aid of a computer. This allows the operator to quickly amend or update the schedule as conditions warrant. The schedule can also be changed from the Critical Path to the Bar Chart at the flick of a switch. All the same information will be displayed, only it will be in a different format.

The Critical Path Method or CPM schedule is so named because it shows the path of task completion critical to the completion of the project in the allotted time. If you look at the simple Critical Path chart provided, you will see a dark line running from task to task. This dark line represents the Critical Path. Tasks on this line must be completed within the task duration displayed or they will push the completion date back by the amount of time they are delayed. Tasks not on this dark line can be delayed by the amount of time shown as slack before they impact the completion date. If you do not have more than twenty-five percent of your tasks on the Critical Path you may have the ability to shift resources to another area while waiting for the delayed task to catch up.

Rolling Schedule

A two or three week Rolling Schedule is a handy tool for the superintendent to use for the

short term management of his job. It allows the superintendent to break down the main schedule into more specific tasks. The main schedule might show two weeks to lay masonry block. The rolling schedule may show four days on the south wall, three days on the east wall, etc. Being able to determine that the south wall will be ready six days earlier than the task as a whole can allow the superintendent to assign men to a job on the south wall earlier than the main schedule indicates the overall task will be complete. It also allows the superintendent to closely monitor manpower, equipment and material needs on a two week basis.

The superintendent can take this one step further if he feels the masons are not staffing the job with enough men. The superintendent can simply ask the foreman how many masons will be on site during those days indicated on the Rolling Schedule. The foreman says there will be eight block masons. The superintendent knows a mason should be able to lay two hundred blocks a day. Simple math reveals that the masonry crew will lay sixteen hundred blocks a day. The south wall requires eight thousand blocks. That will leave them sixteen hundred blocks short at the end of four days. At this point the superintendent can ask the masonry foreman to increase his crew size to ten men so that the schedule can be met.

BUILDING THE SCHEDULE

If you are going to build the schedule there are several ways to approach it. You can start at the first day on the job and assign time to each sub-contractor. Add up the time and hope it does not exceed the limit. You can try the reverse by starting at the end of the job and work the other way.

1. Review time allotted to complete entire project.
2. Produce a schedule based on what you think are reasonable amounts of time for each subcontractor task.
3. Have a pre-construction meeting with the sub-contractors and review the schedule. Ask for input concerning task length, manpower needs, coordination and experience from similar jobs.
4. Adjust the schedule as required but do not exceed the time allotted for entire project
5. When the schedule is completed see that each sub-contractor receives a copy of it
6. Have each sub-contractor sign a form that they agree with the task completion length of their trade

An important part of preparing the schedule will be the pre-construction meeting. Maintain a positive and upbeat attitude. Have an agenda prepared and any forms necessary on hand. Try to get the sub-contractors to buy into making a profit by maintaining the schedule. The sub-contractors will have a chance to coordinate with each other how they will work together. They will also have valuable input to offer to the general contractor. They will be trying to plan their tasks so as to be the most efficient and profitable. Ask each sub-contractor to show how he will man the job. Take notes and be prepared to use these notes in the administration of the schedule. A good superintendent will take this information and incorporate it into a realistic and equitable schedule.

A schedule is formed for the purpose of planning ahead. The superintendent should be in touch with each sub-contractor or supplier two weeks before he is scheduled to arrive on site. Remind them of start dates and task lengths. Inquire if all of their materials, supplies, manpower and equipment are ready. Call your sub-contractors suppliers and check

with them if you have any doubts. Call again two days before the sub-contractor is due. Remember; Use the schedule to plan ahead.

During construction stay aware of job progress on a daily basis. Keep your daily diary current. Try to make sub-contractors aware of slips in the schedule before it is too late to catch up. Work with your sub-contractors for a successful project. Try to go over with each subcontractor his own two week schedule. For complicated projects plan weekly sub-contractor coordination meetings.

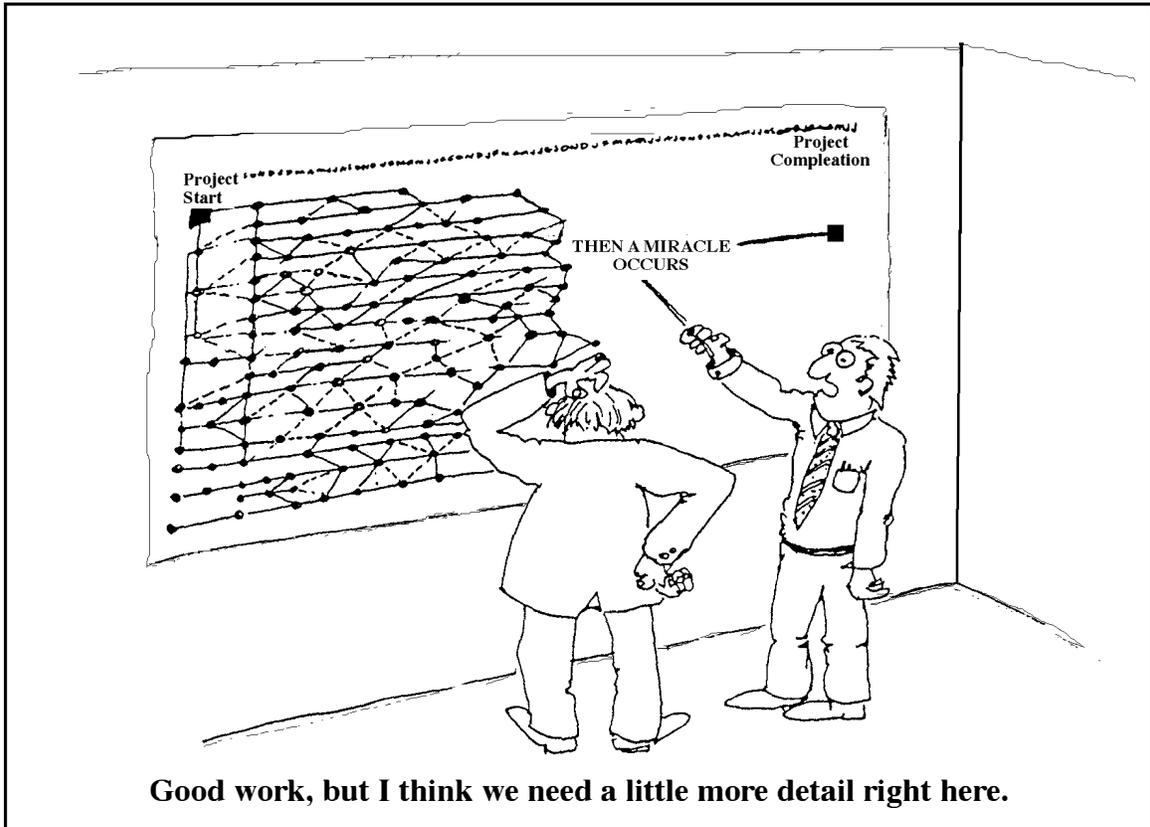
Schedules are projected outlines for what you plan will occur. They are not cast in stone. There will always be some delays, some changes and there will be some sub-contractors that finish early. As the general contractor you have the right to amend the schedule. Let your sub-contractors know as far in advance as possible of any changes in the schedule. Allow them the same task length but alter the arrival date as need be.

Delays that are caused by architects, owners, sub-contractors or unforeseen conditions must be documented. Costs incurred by such delays must be paid by those who cause them. If your schedule shows the concrete sub-contractor pouring the slab on Monday, everything is ready for him and he does not show up, the general contractor has lost that days overhead. You will be forced to reschedule work that was to follow pouring the slab. If this delay forces the block mason to arrive later than he had planned, he may have to reschedule his manpower to work on a small project that will take three days to complete. Now the general contractor has lost a total of three days due to

the failure of the concrete contractor to perform as required. In addition to lost overhead, there may be liquidated damages incurred. It is possible the concrete contractor can be held liable for these damages. That is why it is so important to document all delays.

Occasionally your sub-contractors will finish tasks ahead of schedule. The superintendent is now faced with a delicate situation. The schedule may show the next contractor to follow the early completing sub-contractor not due to arrive until the following week. The general contractor does not want his job to sit idle for a week nor does he want the sub-contractor to charge for accelerating the schedule. The superintendent who has been tracking the daily progress of his job and comparing this information with that displayed on the overall schedule, will know in advance that there will be an early completion of a task. This may give the superintendent enough advance notice to let the next sub-contractor change his schedule without it becoming a hardship.

The sub-contractor may well be within his rights to arrive on site as originally required by the original schedule, so a good superintendent will word his request for an early arrival carefully. The superintendent might say he is giving the next sub-contractor an opportunity to arrive early and get a jump on his work so that he might complete his task before a billing cycle ends. If the sub-contractor arrives and starts early he will still be required to complete his task in the length of time originally allotted.



NOTES:

PARTICIPANT ACTIVITY

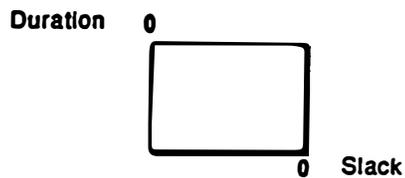
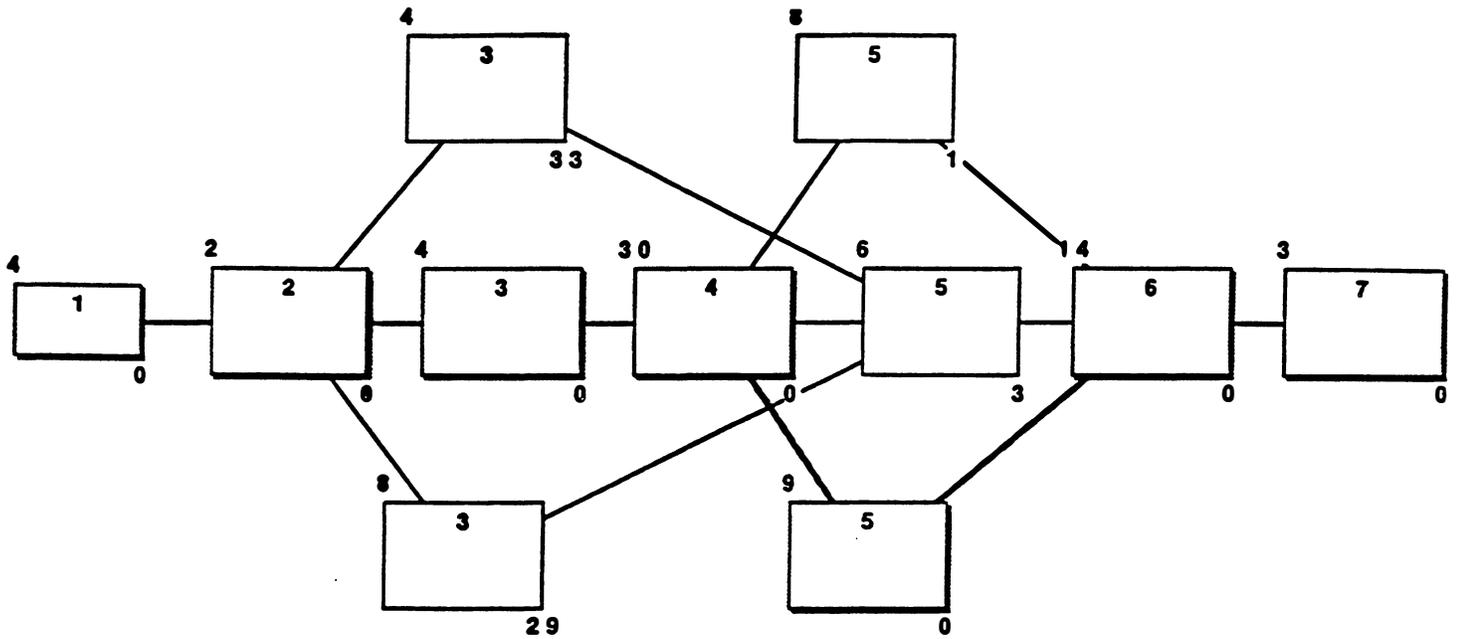
In groups of four to five, build working schedules of a fictional job involving the remodel of a school administration building. The job is supposed to be completed in six months. It consists of the demolition of six existing offices, adding a glassed in lunchroom-meeting area for the faculty and two new restrooms. I will create a delay in each workgroups schedule, use your imagination and experience to solve these schedule problems. Select a spokesperson from each group to review your results with the other participants.

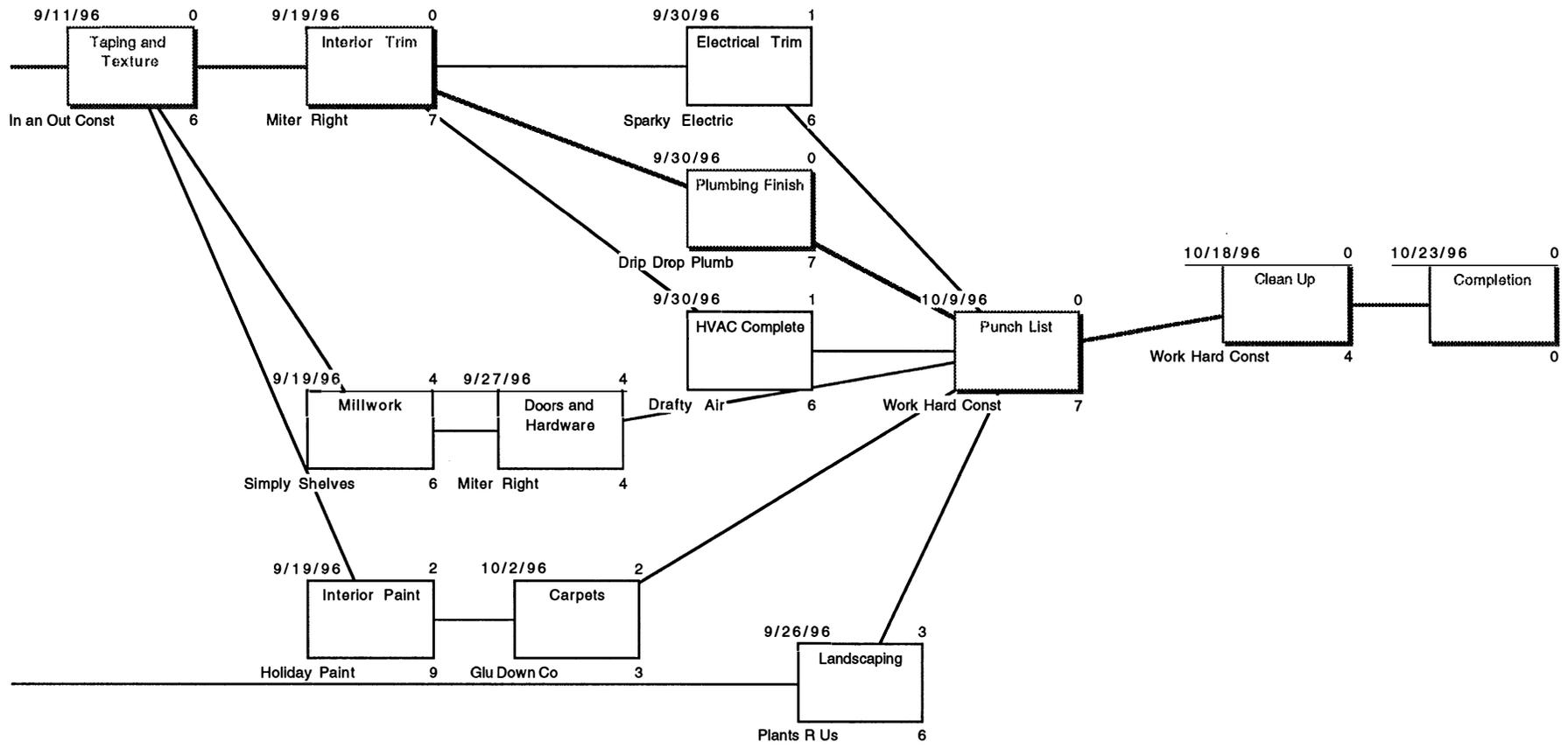
Incorporate the following in your schedule

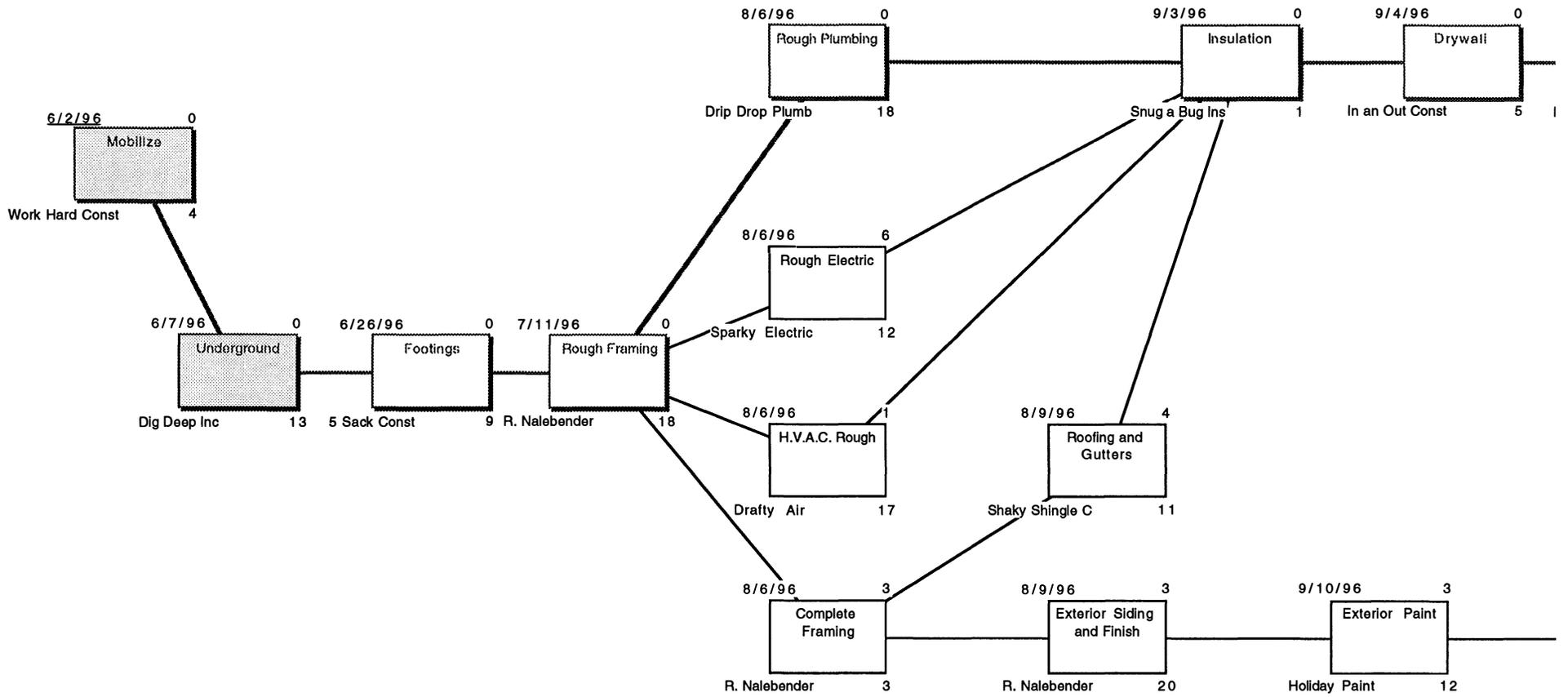
1. List start and finish dates for project and individual tasks
2. Show a logical progression from start to finish
3. Show milestones
4. Note which tasks must be complete before other trades can follow
5. Work must take place 8 hours a day, 5 days a week

NOTES:

C.P.M.
Critical Path Method Chart Shows
Logical Progression of Tasks
Interrelationship Of Tasks
Identification of Tasks
Time Required to Complete Each Task
Start and Finish Dates
Resource - Contractor







8/19/96

8/26/96

9/2/96

9/9/96

9/16/96

9/23/96

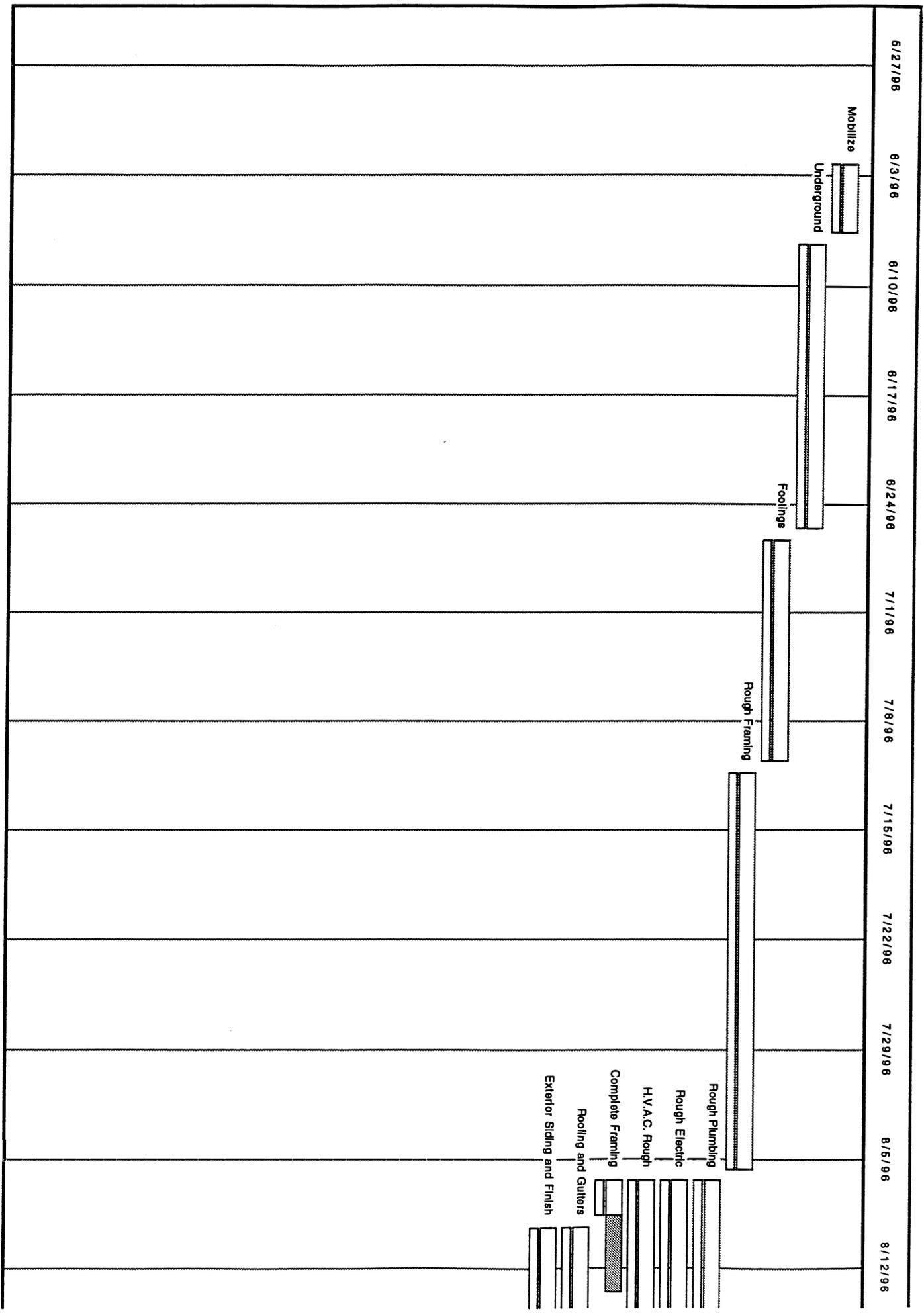
9/30/96

10/7/96

10/14/96

10/21/96





6/27/96 6/30/96 7/1/96 7/8/96 7/15/96 7/22/96 7/29/96 8/5/96 8/12/96

Mobilize

Underground

Footings

Rough Framing

Rough Plumbing

Rough Electric

H.V.A.C. Rough

Complete Framing

Roofing and Gutters

Exterior Siding and Finish

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LEADERSHIP TRAINING PROGRAM

A JOURNEYLEVEL CARPENTER COURSE
FOR LEADERSHIP PREPAREDNESS TRAINING IN
THE MODERN CONSTRUCTION INDUSTRY

“THE SUPER SUPER”

MODULE SIX: MANAGING THE CONTRACTOR’S LABOR FORCE

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Revised: 1/16/02/llr

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NOTES:

MODULE 6 MANAGING THE CONTRACTORS LABOR FORCE

THIS MODULE IS PLANNED TO PROVIDE ANSWERS TO THE FOLLOWING QUESTIONS:

- **Understand where the contractor can increase the profit margin on control of direct labor**
- **Discuss different methods of motivation**
- **Recognize communication breakdowns**
- **Prevent problems in manpower resulting in construction mistakes**

MANAGING THE CONTRACTOR'S LABOR FORCE

The superintendent is charged with one of the most important duties on the jobsite. That duty is managing the company's workforce. These tradesmen and women are the ones that produce the installed work the company has bid on. An estimator has reviewed a set of contract documents and figured that a certain amount of work can be done for a particular price. The estimator has added a figure to the cost to cover overhead and profit. That profit can only be met if the labor costs do not exceed the estimate.

THE SUPERINTENDENTS CONTROL OF DIRECT LABOR BY CORRECT MANAGEMENT WILL RESULT IN THE HIGHEST POSSIBLE PROFIT FOR THE GENERAL CONTRACTOR.

The general contractor you work for has submitted the low bid for the New School Project. Now picture yourself running that job. Your company is going to form and pour the concrete footings, foundations and columns. The company is also going to frame the buildings and provide carpenters for the finish

work. You are going to have to plan how that work is going to proceed.

What work has to start first?

1. Who will perform it?
2. How many people are necessary?
3. What materials do they need?
4. When do they need the materials?
5. What tools do they need?
6. What equipment do they need?
7. Are there other trades work that must be coordinated with this work?

The largest general contractors cost that is not fixed is the cost of direct labor. Direct labor is the crew that is employed by your own company, not the sub-contractors labor force. Remember, the projected cost for the direct labor is an estimate. The actual cost will be what you can accomplish by planning the use of the contractors labor force. If the concrete delivery is late, or a broken skilsaw stops production, the labor costs will increase. If a door was installed incorrectly and a carpenter has to go back, tear it out and reinstall it correctly, the cost of labor will increase. It is now is your responsibility to plan how to use

the crew to perform the work at the least cost to the general contractor.

The general contractors costs for subcontractors, materials and overhead are largely fixed. These are costs that the contractor cannot control. Keep in mind however, that effects of the actions of the subs can cause peripheral costs to the contractor. If a glu-lam delivery is late and your crew winds up standing around, your labor costs are going to increase.

Prime Time

Statistically, one third of your labor cost is spent installing work correctly the first time. Lets refer to this as Prime Time.

Secondary Time

One third of your labor cost is spent in Secondary Time. This is time spent in preparing to work. Some examples of this are laying out tools and equipment, moving materials to point of installation, reviewing plans, preparing job assignments, framing layout, building sawhorses, etc.

Lost Time

Finally we come to Lost Time. Poor quality work or wrongly installed work, time wasted on the wrong or broken tools, material delays, or extended punch lists are some of the items involved. Our greatest savings will be realized if we can cut back on Lost Time.

Job Profits

To increase job profits, the superintendent wants to move as much time as possible into Prime Time.

Our greatest potential for profit will lay in moving time from Lost Time to Prime Time.

This means we must learn to prevent mistakes. Insuring good communications is the most important single item that will prevent mistakes. All carpenters will make an occasional error. But mistakes by a single workman will not have the same impact as an entire crew following confused directions. Poor communications between management and the labor force can result in entire walls or forms being built incorrectly. Those walls that are built incorrectly must be torn down and rebuilt correctly. That could cost four or five times what it should have cost.

Smart planning can cut Secondary Time and keep it to a minimum. One such saving might be to use an apprentice to lay out saws and cords before the journeymen arrive on site. Smart planning means off-loading materials in the area they are needed when they are delivered. When you order material from a lumber yard do you request that the lumber order is loaded on the truck in a logical manner? For example, the materials that are needed first should be loaded on the top of the truck. Most materials are moved an average of six times before they are installed. Proper scheduling to insure materials arrive when they are needed or logically placed staging areas will save time here. Most of Secondary Time is fixed though, so you will not garner a large savings here.

The superintendent must break down the overall job schedule into weekly segments. Use the Rolling Schedule form for this task. The foreman should have this weekly schedule broken into daily assignments. He must be certain the proper tools will be at hand. He must assign the proper man for the job. The size of the crew must be considered. This kind of planning must be utilized for a truly successful project.

The following will help to understand just how much money can be saved by direct control of labor and how those costs affect the profit margin. The figures represent the cost to build a large wood framed building. Labor costs play

a big factor so moving time from Secondary and Lost Time into Prime Time will increase potential profits tremendously. Remember that the total profit on a large job is rarely bid at more than five percent of the total contract.

JOB COST BREAKDOWN

Total Contract	\$2,000,000
Subcontracts	\$1,050,000
Materials	\$ 150,000
Labor Costs	\$ 600,000
Profit 5%	\$ 100,000
Overhead 5%	\$ 100,000

As you see, the labor cost is \$600,000.00. If we divide this into three equal parts each phase of labor is worth \$200,000.

If you can save 10% of Secondary Time	\$ 20,000
If you can save 25% of Lost Time	\$ 50,000
Total Savings	\$ 70,000
Add Total Savings to Profit	\$100,000
New Total Profit	\$170,000

If you look at these figures you will see we increased profit by 70% more than the original amount. Remember we cannot save much on fixed costs, but we can certainly learn to manage our direct labor profitably.

Most workmen want to do a good job. They take pride in their work. How many times have you driven around town showing off projects you worked on to members of your family or friends? Members don't like to see their time being wasted. Standing around on the job site without having a specific task to perform makes the day drag on. Try asking your crew members how they think a certain task might be more efficiently performed. Listen to their input and try to incorporate some of their ideas.

Involving workmen in management decisions means they contribute more than just their labor. When workers feel they are an important part of the project their interest in it increases. It is no longer just a job to them. Their ideas might mean higher profits. Higher profits can mean continued work and increased wages.

A good superintendent will create an atmosphere of good will and teamwork. An occasional pat on the back will go a long way. Try addressing your workmen by their last name to show that you have respect for them. Set realistic goals for your crews to achieve. When they do achieve the goals reward them. A twenty dollar pizza on Friday is certainly

worth the increased output of a team of motivated carpenters.

PREVENTING MISTAKES

Perhaps the easiest method for preventing mistakes is to insure that good communications exist between yourself and your workmen. This may involve a morning job site meeting with the crew. At this time you might review the days objectives, assign tasks to individual carpenters and laborers and discuss what is expected of each person.

It is easy to say that you want Tim, Lou and Phil to frame the walls shown in the plans on page A2.3. The hard part is insuring that each carpenter is familiar with all the construction details. There may be a note in the Structural section that states headers for openings over 72 inches will be 6 x10s. Are you sure all the carpenters are aware of this? There may be a detail on yet another page that shows how framing clips are to be used at different openings. Does each carpenter have a copy of the Simpson catalogue that shows how each piece of hardware is used and how the manufacturer specifies it is to be attached? Your different carpenters are not going to be as familiar with the plans as you are. There is a method that can be used to insure that framing details are available to those that will be incorporating them.

A good superintendent or foreman will clip out all necessary details and compile them on a clipboard for those that will need them. For example, the carpenters building the wall on A2.3 should receive a clipboard containing all the details from structural showing framing

clips, lumber dimensions, hold downs, nail spacing, bolts etc. Architectural details should show length and height of walls, blocking locations, openings etc. The point is that the carpenters should not have to search through the plans and specs to find all the references to the walls, that is your job.

Compile this information, enlarge the details if necessary, and present it in a easy to read format. You have probably spent a great deal of time becoming familiar with the plans. Share this knowledge with those that need it. You will find that there will be less rework if this method is followed.

In the coming years the labor pool the contractor will draw from is going to change dramatically. Look for more women and more minorities on the job site. This can mean changing the way you are used to working. Language difficulties may arise or a Port-o-John for the women on the job may be required. Improved products and methods of application may mean more technologically advanced tools and workers with experience or training using those tools are needed.

All of the previous goes to show that Lost Time is usually a management caused problem, not something to blame on poor labor. Ask yourself what you could have done differently to prevent a mistake that caused extra work. If there is something you could have done to prevent the problem, write down instructions instead of yelling them up to someone on the second floor, then you are responsible for the mistake. .

This Happened to Me

There I was, my first day on the job, working on a ten foot folding ladder in the hallway of the new school. The hallway was busy with other carpenters and subcontractors all doing their respective jobs. I was nailing up hangers for the ceiling joists, for about an hour, with TECO nails when I reached into my pouch and found I had run out of nails. Damn, I had to walk down the hall, down the stairs, across the field and into the tool shed. I filled up my pouch with the nails, took some extras in a sack and headed back to my previous activity. I walked back across the field, up the stairs and down the hall to the ladder.

WAIT A MINUTE! WHERE THE HELL IS MY LADDER?

While I was gone someone came by and took my ladder, my extension cord and my saw. How was I supposed to get my work done? I spent the next half-hour searching the different buildings for my missing equipment. Of course the carpenter foreman found me wandering the site and immediately jumped on my case. "Why aren't you done nailing off the hangers? I gave you a simple little task and you can't get it done. If this is the way you work I don't know if we can use you around here". My explanation fell on deaf ears and as a result I did not make a good impression with that outfit.

Questions?

1. Whose fault was it that the equipment was taken elsewhere?
2. What could have been done to prevent this from happening?

GROUP ACTIVITY PROBLEMS

1. Your company is building a large wood frame building with many different details at varying wall locations. For blocking, these include locations, heights, material sizes and methods of attachment. List three ways you can prevent trades persons from making costly errors
2. Discuss among your work group 2 or 3 jobs you were on that had one problem after another with the superintendent communicating with the work force. If you were running that job what would you do different from that superintendent?
3. As superintendent on a ground up project away from home, involving 6 different buildings with a large amount of concrete forming you are ready to hire your carpentry crew. With your group, discuss and decide what the five most important attributes you would look for in your fore person, carpenters and apprentices.
4. After working as a carpenter and carpenter fore person for 7 years your company has promoted you to superintendent. On your first job your crew consists of trades persons you have worked with for those seven years. Is this an advantage or a drawback? Discuss why and list several reasons for both sides of the question.

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LEADERSHIP TRAINING PROGRAM

“THE SUPER SUPER”

MODULE SEVEN: THE DAILY DIARY

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Revised: 1/16/02/llr

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NOTES:

Module 7 The Daily Diary

THIS MODULE IS PLANNED TO PROVIDE ANSWERS TO THE FOLLOWING QUESTIONS

- **Understand the importance of keeping a Daily Diary**
- **Know what should be entered into the Daily Diary**
- **Remember methods for making record keeping easy**
- **Recognize the different components of the Daily Diary**

IMPORTANCE OF THE DAILY DIARY

The superintendent normally has the responsibility of maintaining a daily account of all construction activities occurring on the job site. Since the General Contractor can potentially be held liable for all activities, accidents, delays, warranty service and completed project, the superintendent must keep accurate, complete and up to date records.

These chronicles might be useful in responding to questions from the architect, necessary in a formal reply to an owners concern and essential in proving the General Contractors integrity in a court of law or in arbitration. The superintendent must keep in mind that he is working for the General Contractor and the records are taken from that point of view.

Who are you writing the Daily Diary for?

Your company requires you to write an account of the days' activities on the job site. The architect normally gets a copy of this information along with the project manager, yourself and possibly the owner of the project. They all have a vested interest in what occurs on your jobsite. They all want to check on job progress and delays.

How this information is presented will impact different people in various ways. Suppose an architect or owner of a project is reading your Daily Diary. If you have grammatical errors or spelling mistakes the owner or architects opinion of you and your company will be lessened. The owner of a \$30,000,000 project is not going to be impressed with your intelligence if you spell plumber as "plummer". If you are hand writing your diaries your penmanship will have an impact on the reader. Computer generated diaries with spell and grammar check are becoming more common. This can help but again your attention to detail will be paramount in making a good impression.

The company you work for and the contract documents usually require that you write the Daily Diary. When you write the diary, think of who will be reading it and how it will be used. If you write the diary for the lawyer you will meet in court two years after the fact, you will probably have all your bases covered. If the architect asks you a question about something you wrote, it will probably be something that you can answer using your memory. The lawyer who asks you a question may want facts from two years previous. Your memory will be of no use in the courtroom. In the courtroom all

will focused on what is recorded in writing. You must write the diaries in such a way that all pertinent information is concise, complete and correct.

The Daily Diary may be applied in several ways. It can be taken as a single page describing a single episode or utilized as a daily record of events from day one to job completion.

Most companies provide a form for the superintendent to fill out the pertinent data. Filling in the blanks on a daily basis will result in the most accurate records of events. Most forms have blank spaces for the following information:

- *Name of job*
- *Company job number*
- *Date*
- *Day of week*
- *Days remaining to complete contract*
- *Weather conditions*
- *Job Delays*
- *Employees present and their trades*
- *Sub contractors employees present and their trades*
- *Accident report*
- *Safety report*

There will be an area to describe the activities of the day performed by both the General Contractor and the sub contractors. There may also be an area to describe important conversations. One of the easiest ways to maintain an accurate diary is to write it or keep notes on a daily basis. Trying to remember what happened last week and writing 5 or 6 diaries in one sitting will result in mistakes that can come back to haunt you.

Some of the information asked for in the form is quite simple and self explanatory. Nonetheless, the information is important and should always be provided. Forgetting to write down the date, the name of the job or even the day of the week, could cause serious implications if the document was called on to settle a dispute in an arbitration case.

Filling in the weather conditions and job delays sections may provide backup when asking for additional time to be added to the contract. Six months later the chances of your remembering what the weather conditions were like on a particular day are slim to none.

1. Just how much detail should you provide describing the activities of the day?
2. Should you transcribe every phone call to every sub contractor, architect, owner, supplier, etc.?
3. Should you name every workman and describe what he or she did during the day?

A daily log of the day should describe the activities in such a way as to show what portion of a task has been completed. If you are framing a building and have, in addition to your own carpenter and laborer crew, plumbers and electricians, you should simply describe what your employees did, and what the sub-trades employees did.

“Framing on Acme Tools building today,” does not carry much detail. “Two carpenters shearing north exterior wall, 80% complete, six carpenters framing interior walls, 25% complete, two carpenters installing Glu Lams, 90% complete, and one laborer cleaned the slab and provided materials for carpenters,” will give enough information to accurately track the tasks described.

The more detailed log of the days activities will allow the project manager to accurately assess

the progress of the job. Accurate information provided in the Daily Diaries will aid the estimator in calculating costs realistically when bidding on the next project.

If your company breaks down the tasks into sections such as:

- *1001 Supervision*
- *1002 Layout*
- *1003 Wall Framing*
- *1004 Blocking*
- *1005 Shearing*
- *1006 Joisting*

you should try to report the activities as they are coded in your Job Cost updates.

SUB CONTRACTORS

Keeping track of your sub contractors should be accomplished in much the same way as tracking your own employees. How much of each particular task did each sub contractor complete? How detailed should the report be?

Listing the number of employees and their trades allows the project management team to track manpower and may be used to substantiate certified payroll along with time cards. It may also be used to settle disputes months or even years later as to whether or not the job was adequately manned.

Keeping track of the sub contractors employees on site can be used in much the same way as tracking the general contractors employees. If the sub contractor is not keeping up with the schedule and maintains he is doing what he can to complete his contract in a timely manner, a review of his staffing the project may be in order. Remember to mark down the manpower

for any sub contractors that are sub contractors to your main sub contractors.

“Plumbers installing pipe in Acme Soda Works building.” This statement, while true, certainly could be expanded to greater detail. “Four plumbers installing 2” water line on second floor, 10% complete. Existing valves on second floor were not as depicted in drawings. I spoke to Ron, the plumbing foreman, he told me that he informed John Doe, his Project Manager and an R.F.I. form asking how to proceed was being prepared and would be faxed to our office before 10 A.M. tomorrow.” This last statement will allow you to track what is being done, how much is completed and any problems that occurred.

Recording an important conversation with a sub contractor can be very valuable. If you have a phone conversation with your Glu Lam supplier and he tells you a date they will deliver the beams, note the discussion in your Diary. See that the supplier gets a copy of the section of the Diary that pertains to him. If he disagrees with the information you recorded he can respond to it. If you rent a forklift to unload the beams on the day they were promised and they do not show up, the supplier may be held liable for damages incurred.

Remember to document any accidents that a sub contractors employee might suffer. Take pictures, interview witnesses and note the circumstances that led to the injury. Note this information because this information can possibly save the general contractor an expensive lawsuit.

This Happened to me

I was working in my yard on Sunday when a man got out of his car, walked up to me and asked "Are you Dennis Rose?" When I answered yes he handed me a subpoena and informed me I had been served. I was required to appear in court to testify about a job that I had run two years previous. A painter was suing the company I had worked for, claiming he had become injured when he slipped on some drywall debris in an exterior planter area. I was called to the stand by the painters' attorney to answer questions about the incident. I had no record of any injuries occurring on that site, so I was confused to say the least. I was told the incident happened on a Saturday when I wasn't there. I looked up in my Daily Diaries and I did not have anything written for that Saturday. I did read something very important though. I had written on the Thursday before this incident that the drywall company had completed all installation and that the scrappers had cleaned up all debris inside and out 100%. When the lawyer and the judge read this statement they decided the case had no merit and the suit was thrown out. This resulted in a saving of \$50,000 that the painter was asking for.

Questions?

1. What was the important statement that resulted in the case being thrown out?
2. How did I know what to write in the diary that would save the contractor money?
3. Who are Daily Diaries written for?

NOTES:

JOB COST - TO - DATE REPORT

PHASE NUMBER	DESCRIPTION	TYPE	EST COST	WEEK	MONTH	YEAR	JOB	EST	ACT	COST REMAINING
CAT NUMBER 00010 CAT NAME GENERAL CONDITIONS							JOB NUMBER 009605			JOB NAME UBC OFFICE SPACES
001252	SUPERVISION-LABOR	L	33600.00	67.50	607.50	769.50	769.50	.00	2.29	32830.50**
001352	JOB CLEAN-UP-LABOR	L	2520.00	.00	.00	.00	.00	.00	.00	2520.00
008002	DOORS & HARDWARE	L	3675.00	.00	.00	.00	.00	.00	.00	3675.00
CAT TOTAL			39795.00	67.50	607.50	769.50	769.50	.00	1.93	39025.50
CAT NUMBER S 00065 CAT NAME SITE CONCRETE										
002002	DEMOLITION-LABOR	L	1207.00	.00	.00	.00	.00	.00	.00	1207.00
003002	CONCRETE-LABOR	L	130.00	.00	.00	.00	.00	.00	.00	130.00
CAT TOTAL			1337.00	.00	.00	.00	.00	.00	.00	1337.00
CAT NUMBER 00065 CAT NAME CARPENTRY										
006002	FRAMING - LABOR	L	1624.00	.00	104.12	432.23	432.23	.00	26.62	1191.77**
006003	BLOCKING	L	389.00	.00	.00	.00	.00	.00	.00	389.00
006004	PLYWOOD SHEAR	L	3236.00	.00	.00	.00	.00	.00	.00	3236.00
006005	JOISTS & GLU LAMS	L	12285.00	.00	43.02	43.02	43.02	.00	.35	12241.98**
006006	PLYWOOD ROOF	L	1158.00	.00	.00	.00	.00	.00	.00	1158.00
006007	FORMING	L	1140.00	.00	.00	.00	.00	.00	.00	1140.00
CAT TOTAL			19832.00	.00	147.14	475.25	475.25	.00	2.40	19356.75
CAT NUMBER 00170 CAT NAME ALLOWANCES										
050005	BURDEN	F	45020.00	33.07	524.71	764.86	764.86	.00	1.70	44255.14**

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LEADERSHIP TRAINING PROGRAM

“THE SUPER SUPER”

MODULE EIGHT: JOB CLOSE OUT

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Revised: 7/02/97/lr

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NOTES:

MODULE 8 JOB CLOSE OUT

THIS MODULE IS PLANNED TO PROVIDE ANSWERS TO THE FOLLOWING QUESTIONS:

- **Understand what is meant by Job Close Out**
- **Know when to start the close out process**
- **Remember methods for making the job go smoothly**
- **Recognize potential problems and head them off**

JOB CLOSE OUT

Preparing to close out a job is a process that starts at the beginning of the project. Familiarize yourself with the close out procedures, as outlined in the contract documents, before the pre-construction meeting. Most Bound Project Manuals have a section devoted to this subject. Any questions that arise may be answered at that time. The company you work for may have its' own policy, paperwork and procedures. A Quality Assurance Plan can be a helpful tool for reviewing with all trades what is expected of them. Insure that you are familiar with all that this entails. "The last ten percent of the work on a job takes fifty percent of the total time for the job." Unfortunately this statement holds too much truth to be lightly discarded. Final finishes, carpet, painting, light and plumbing fixtures, ceilings, alarms, speciality items etc., all have to be coordinated so that each individual trade can install without causing unexpected delay to the other trades. Each trade must also take care not to damage the finish of other trades. Have you ever seen a workman standing on top of a newly installed cabinet, or heard another tradesperson say he or she did

not care about the painted walls because they had their own work to do?

A common problem is that electrical fixtures, although on site, have never been taken out of their boxes. The electrician attempts to install the fixtures and finds the wrong lenses have been shipped or perhaps some of the lenses are damaged. With only two weeks left to complete the project this can be a real problem. A six week lead time for speciality electrical items is normal. Items that are shipped to the site in boxes should be opened upon arrival and checked for damage to contents and conformance to specifications.

Getting your sub contractors to transfer their as built to sepias, turn in guarantees, manuals, keys to equipment and extra materials as required, should be treated the same way as any other task. Have the requirements for close outs on the schedule and treat any delay of delivery of same as a delay of completion. These closeouts are by their nature a item on the critical path of completion.

As your project enters into the completion stage, create a list detailing work to be completed. Include items that are not correct or not to the standard of workmanship required. Avoid calling the list of items to complete a

punch list. Tell your sub contractors that these items you listed must be completed before the architect will inspect for a punch list. Many subs will try to tell you they will pick up any incomplete items on the architectural punch list. Do not accept this as a valid excuse for not completing. If all your sub contractors try to hand you this excuse you will never get done. Do not let the sub contractors reduce the size of their man power to a point where each item is taking so long to complete that other sub contractors are being delayed. Inform your sub contractors that incomplete items mean that they have not completed their task and cannot be paid for it until all items are done. Impress upon your sub contractors that if they complete correctly they will have no punch list and no reason to return to the job site.

One month before the scheduled completion date draw up a completion schedule up and have a meeting with all sub contractors still having work to complete. Review material and equipment delivery dates. Insure that work left to be done has adequate manpower allotted. Leave time for clean up, owner instruction and the dreaded architectural punch list.

Prepare your sub contractors and the owner for the job completion by removing your trailer and temporary facilities as soon as possible. Move your office into an unused room or work out of your truck if possible. Act like the job is almost done. Clean the job site and the interior. Issue letters to the sub contractors making them responsible for keeping the site and the interior clean. Do not allow any food or drink in the buildings. Lock rooms, if possible, and only allow access to the sub contractor working in that area at that time.

Inform the owners of your intent to turn the building over to them. Give the owners beneficial occupancy only if they are willing to accept responsibility for any damage caused by

moving in or occupying the premises. Put all utilities in the owners name as soon as possible. See that they know how HVAC, alarm, plumbing, electrical, and sprinkler systems work. Usually there are specific requirements for certain trades to have a training session for the owners and their representatives to familiarize themselves with the operations and maintenance of each system.

The time has arrived. You think you are basically complete and inform the architect and owner. A date is set for the final walk through. Prepare for this event by having a punch list equipment package. This usually will consist of some paint and brushes, (Have the painter accompany you if possible), WD 40, caulk, polish, cleaner, spot remover, rags, assorted screwdrivers, wood putty, or other items that can be an aid in fixing last minute items that come up.

While accompanying the architect on the walk through do not argue over items he or she may want to place on the list. You can respond in writing at a more appropriate time. A spot on the wall, a pencil mark, etc. can be taken care of immediately. Note each punch list item and who is responsible for removing it from the list. Issue your list as soon as possible and give the sub contractors warning as to when it must be completed.

If the punch list is prepared and issued one week before the completion date that is all the time left to finish any items on the list. If the sub contractor tells you he needs more time inform him that any additional time taken to complete the job will be considered a delay and he will be responsible for any damages that may occur. This should provide added impetus to complete quickly. The punch list should never be considered as additional time after the tasks are complete. The tasks are not complete

until there are no punch list items left on the list.

If you have to return to the site to check on your sub contractors, or make special trips to give the sub contractors access or any other unexpected returns to the site, give your sub contractors warning they may be held responsible for paying for your time and or overhead.

Provide whatever incentive is necessary for each sub contractor to complete. One sub

contractor may require a telegram threatening to have another contractor complete his work at the original sub contractors cost. Another sub contractor may only require a phone call informing him he has to finish three minor items and you'll meet him for lunch.

Do what it takes, get the job done and go to the next successful project feeling like a winner.

This Happened to me

I was running a large remodel of the District Attorneys' and Public Defenders offices in San Jose. This project consisted of seven floors, each about 25,000 sq. feet. We had to replace the existing acoustical ceiling and install new lighting, H.V.A.C. drops and grilles, reposition sprinkler heads and run overhead communications. During this remodel process many different workmen had to access the space above the ceiling. This meant extending ladders through the ceiling grid and climbing into the interstitial space. As you might imagine there were a good many ceiling tees and main runners that were damaged. Before the architectural walk through for the first floor I identified the damaged ceiling members. When I asked the different trades who had damaged the ceiling the overwhelming response was, "Not me." The general contractor paid for the damage to the first floor.

Questions?

1. Why did the general contractor pay for the first floor?
2. How did the general contractor avoid paying for the other floors?
3. Is there a way to prevent the damage from occurring?

NOTES:

QUALITY ASSURANCE PLAN

JOBSITE QUALITY ASSURANCE PERSON DENNIS E. ROSE

Phase 2 Onsite Procedures

- Maintain Quality Assurance Log
- Have submittals on hand to compare with delivered items
- Coordinate with other contractors affected by our materials or equipment
- Insure materials and equipment are as specified in contract documents
- Check that materials and equipment delivered to jobsite are new, undamaged and are of proper quantity. Provide copy of invoice for Construction Manager if requested
- See that materials and equipment are stored in a safe and protected area
- As materials or equipment is installed, insure installation is in accordance with contract documents and in a manner complying with standards of the industry
- Upon completion of installation notify Construction Manager with inspection request form
- If necessary, correct deficiencies noted by Construction Manager
- After approval by Construction Manager, items may be inspected by I.O.R.
- After receipt of inspection approval by I.O.R. {if necessary} work may be covered
- Maintain any temporary construction facilities as described in Contract Documents, {fences, signs, guardrails, etc.}, as necessary
- Verify that cleanup procedures are met per Contract Documents for both daily and final cleanup

QUESTIONS

1. When does the Close Out procedure start and by whom?
2. List several ways you have seen workmen and women cause damage to other trades. What can you do about this problem?
3. How can you keep an architectural punch list to a minimum?
4. Does your company have a Quality Assurance Plan?

LEADERSHIP TRAINING PROGRAM

“THE SUPER SUPER”

MODULE NINE: REVIEW OF TRADES

NOTES:

Module 9 Review Of Trades

THIS MODULE IS PLANNED TO PROVIDE ANSWERS TO THE FOLLOWING QUESTIONS:

- **Understand problems of each trade**
- **Know how to head off potential mistakes with other professions**
- **Remember methods for making the job go smoothly**

REVIEW OF TRADES

In today's contracting environment the General Contractors' superintendent must be aware of all trades that are a part of the project he or she is going to administer. For a successful project the sub contractors are going to depend on the general contractors superintendent to schedule and help find answers to problems that arise on site. Many of the problems that come up are typical of almost all job sites. Knowing what some of these problems are going to be and knowing how to resolve them before they adversely affect the project, will be beneficial to the successful completion of the project.

The following lists were compiled by discussing with the sub contractors problems they have seen during the course of their contracting experiences. Input for these lists was also derived from talking with architects, owners and other general contractors superintendents. This is certainly not meant to be a complete list of all possible problems. I expect to see the lists expanded as they are discussed in class. Each carpenter, with experience on job sites, has seen how he or she could save time on the project if only something was done differently. Your input will help these lists to grow.

DIVISION ONE: SUPERVISION

1. Take the time to review plans and documents with all involved in the project.
2. There is no such thing as a dumb question. Treat all persons on site fairly, both direct labor and subcontractors' employees.
3. Make sure that all subs have enough extension cords and pigtails to perform their work. Also see that this equipment is marked with the owners logo.
4. Insure that all temporary facilities are installed and operational.
5. Stress safety as first requirement of any job. Review general contractors safety policies and job site safety plans with new employees and sub contractors.
6. See that as builts are recorded on a weekly basis and before covering.
7. Check that new employees have proper and sufficient personal hand tools before starting work.

DIVISION TWO: SITE WORK

Demolition

1. Review plans and specs with demolition foreperson before work proceeds.

2. Review safety procedures for all personnel that will be on site including civilians who may be on adjacent sidewalks.
3. Mark structures or specific items to be demoed. Mark items or areas that are going to be saved.
4. Check for possibility of recycling metals, concrete, paving. Check for reuse of doors, windows, mirrors, carpet, etc.
5. Layout path for egress and exit of trucks, heavy equipment, cranes and the likes.
6. Mark safety zone for falling debris with barricades or other marking system.
7. Erect dust barriers when working in occupied areas.
8. Insure that areas to demo are safed off from electric, water, etc.
9. Maintain trash cleanup on a daily basis.
10. Check that no hazardous materials are on site, asbestos, lead, chemicals, etc.
11. Protect finishes of items to remain.
12. Inform workers in nearby occupied areas about noise or other conditions that may affect them.

Underground Services

1. Contact U.S.A. for location of existing utilities and have the locations marked.
2. Check with city or appropriate agency for location of water main or sewer in street.
3. See that barricades, flagmen, caution tape, lights and the like are in place.
4. For trenching situations see if trench plates are required and who supplies them.
5. Insure proper materials are used for backfill and check in advance for compaction requirements.
6. Check that lift heights are not exceeded during backfill.
7. Patches in the street must be completed in a professional manner.
8. Sidewalk and curb patches normally should go back to nearest existing joint. Check for proper concrete mix and color of concrete.
9. Check for any vault elevations. Will concrete or paving blend in smoothly at these elevations?
10. Make sure as builts reflect actual locations and elevations.
11. Use a probe when digging in tight locations.
12. Maintain all required shoring.

Paving and Surfacing

1. Review plans and specs with foreperson before work commences.
2. Before paving check elevations for proper drainage.
3. Trenches, depressions etc. must be back-filled with proper materials and compacted to required amounts before baserock and asphalt is applied.
4. Surrounding areas should be protected from asphalt. This includes curbs, sidewalks, walls, buildings etc.
5. See that barriers are provided to protect new paving. All traffic should be diverted for 24 hours. Do not allow foot traffic from fresh asphalt onto sidewalks or into buildings.
6. Transitions from old asphalt to new should be smooth and well sealed. Finished product should be free from bony or gravelly areas.
7. There may be advantages to installing the parking lot before building erection. This creates a smooth level area for material storage and staging. This also allows equipment to arrive and exit easily. During rains the project can continue free of mud.
8. During dusty site conditions, make sure areas are watered down.

DIVISION THREE: CONCRETE

Concrete Formwork

1. Review plans and specs with foreperson. At pre-construction meeting review other trades impact on forms.
2. Forms must be straight or curved to correct degree of arc.
3. Forms must be properly secured with correct and sufficient bracing. Concrete weighs about 135 pounds per cubic foot or 3645 pounds per cubic yard.
4. Wall and column forms must be erected straight and plumb. Check for downspout leads, conduit, pipes etc. before pouring.
5. Check for allowable lifts in pouring concrete. See specs, code and architect or engineer.
6. Release agents and curing compounds should be on site in sufficient quantities before pouring. Check for compliance with E.P.A.
7. Exposed columns should line up and have finish quality appearance. Sack and patch as necessary, within 24 hours if possible.
8. Double check ADA requirements before pouring ramps, sidewalks etc.
9. Make sure concrete tag from truck driver matches mix design before pouring.
10. See that all trades have access before closing forms.
11. Check weather conditions a day before any pours.
12. Always have a backup vibrator for any pour.

Concrete Reinforcement

1. Review plans and specs with foreperson.
2. Check for steel size, number of bars, spacing, hooks, cages etc.

3. Coordinate with concrete sub for placement of rebar and concrete pour.
4. Rebar should hang securely supported, mats should have dobies beneath, usually one and one half inches of clearance to edge of form.
5. Steel should be straight and level with bars evenly spaced.
6. Insure that shop drawings match structural plans.
7. Inspect laps for code compliance.
8. Do not allow rebar to be heated to facilitate bending.
9. Review plans and specs for requirements on mechanical connectors or welded splices.
10. Make sure rebar is clean and ground underneath rebar is free of debris.
11. Protruding rebar must have O.S.H.A. approved protective covers.
12. Ask electricians if UFER ground is required.

Concrete

1. Review plans and specs with foreperson.
2. Insure mix design has been submitted and reviewed by architect.
3. Check that concrete pump or placing equipment is scheduled for day of pour.
4. Insure that gravel, sand and vapor barriers are correct.
5. Verify weather conditions are suitable for concrete placement.
6. Confirm all imbeds are in place before pour.
7. Check on finishes for flatwork, exposed aggregate, broom finish, etc.
8. Saw cut expansion joints should be done within 24 hours of concrete pour.
9. Sub contractor should protect all flatwork from damage until it is fully cured.

10. Make sure all inspections of items installed by other trades has been inspected and approved.
11. Before pour, insure you have sufficient manpower for task ahead.
12. Use 30d or 50d nails in lieu of 16d nails to secure bottom of form placed on concrete slab. This makes nails easier to locate and simplifies stripping.
13. Wash out area for trucks and equipment should be located before pour starts. Watch that wash areas do not drain into catch basins, storm drains or sewers.
14. Protect walls and flatwork from graffiti and vandalism.
15. Check that you have enough cement masons on hand for the flat work finish.
11. Block must be clean and dry at time of use. Review specs for allowable temperatures at time of installation.
12. All concrete pads and surrounding areas must be cleaned of mortar droppings, all broken and leftover block hauled off, mixing area cleaned, scaffolding removed and extra rebar picked up before job is complete.
13. Grout joints may require special mixes for waterproofing.
14. Stress scaffold safety before start of work. Insure qualified erectors are assembling scaffolding per new OSHA requirements.

DIVISION FOUR: MASONRY

1. Review plans and specs with foreperson.
2. Check for light, medium or heavy weight blocks.
3. Look for size, style and pattern of placement.
4. Insure rebar is installed as required, also expansion joints.
5. Have all imbeds on site at start of masonry work. Verify who does layout and placement.
6. Watch for correct placement of imbed hooks. Usually they are installed behind vertical or horizontal rebar.
7. Check for allowable grout lifts. Usually six feet at a time.
8. Check specs and submittal for grout mix. Check batch time, delivery time and placement time.
9. Confirm if block is going to be exposed, stuccoed, wrapped etc. for correct joint tooling.
10. Exposed block walls must be cleaned of excess mortar. Joints must be neatly tooled.

DIVISION FIVE: METALS

Structural Steel

1. Review plans and specs with foreperson.
2. Check engineers details and compare with shop drawings.
3. Look for columns too wide for walls, check bucket elevations and their orientation to building.
4. Confirm architectural elevations for column heights. Allow for beams, pony walls, plates, roofing, etc.
5. Templates and column bolts should be on site before concrete pour. Check column plate details for placement of bolts and templates.
6. Column bolt placement should be accurate to + plus or - minus one eighth inch on building layout plans. This applies to elevation and east, west, north and south planes.
7. Columns are normally placed after slab is poured. Diamond or circular blockouts are normally employed.
8. After elevations are checked column plates are grouted and blockouts are poured.
9. Brace columns while placing beams to prevent any shifting. Insure columns are in line and perfectly plumb.

10. Bolts and connectors are usually supplied by structural steel sub contractor. Check for correct size by pre installing bolts in buckets. This will also prevent loss or mix up during course of job.
11. Retighten nuts and bolts prior to covering.
12. **Stress** crane and rigging safety. Hand signals should be reviewed before start of pick.
13. When burning or welding galvanized steel make sure breathing apparatus is used and fresh air is available.
10. Check that framer has installed all blocking. This includes bath accessories, cabinet blocking, ledger blocking and roof access, etc.
11. All walls must line up as shown in plans, bent or twisted studs must be straightened or removed.
12. Confirm that all required strapping is installed, special hardware, hangers, or concealed structural connections are all as per details. See that all fasteners are installed per manufacturers requirements or structural details.

DIVISION SIX: WOOD AND PLASTICS

Carpentry

1. Review plans and specs with foreperson.
2. Watch for discrepancies between architectural and engineered drawings.
3. Confirm correct number of platforms for H.V.A.C. or other equipment is represented in all sections of plans.
4. Verify framing dimensions for doors, windows, etc. Look at submittals for this type of information. Allow for drywall, stucco, wood surrounds or other conditions affecting framed openings.
5. Insure that openings are plumb and level. Check after walls are plumb and lined.
6. Look for lumber grade stamps. Review specs for compliance with pressure treated, structural, standard or better, construction or architectural grades. Watch for moisture content requirements in specs. Lumber should be straight and free from imperfections affecting framing.
7. Lumber should be stored in such a way as to protect it from vandalism, theft and the elements.
8. Kiln dried lumber should be covered to prevent moisture increase in wood.
9. Make sure that framing elevations match architectural elevations.
13. Watch for nailing pattern on structural walls. Nailheads should not be set below top layer of veneer in plywood. Use binoculars to inspect areas out of easy access.
14. Plywood over joists, trusses or rafters should run across grain at 90 degrees to square exterior walls and framing members. If not, something is out of square and must be corrected.
15. All framing cuts should fit tightly. This is especially important at rafters, hips, valleys, stairs, etc.
16. Check on nail sizes for use in different applications, plate to stud, toe nailing, etc.
17. Gap exterior plywood per manufacturers recommendations.
18. Check that layout person does not use indelible paint for layout on exposed surfaces.
19. Take photos or videotape walls prior to closing up. This will show locations of blocking, conduit etc. for future reference.
20. Make sure that layout takes into consideration needs of plumbers, electricians, etc.
21. Review safety precautions, handrails, stairs, life lines, scaffolding, guard rails, etc.
22. Limit waste by ordering and cutting lumber in correct lengths.
23. Watch that nails are not placed in plates where plumbers and electricians have to drill.

24. Use beeswax when drilling or nailing into hardwoods.

Finish Carpentry

1. Review with foreperson plans and specs.
2. All exposed work must look good. All joints tight, nails and screws set.
3. Wood may be sanded and finished before installation.
4. All work must be straight, plumb, level or curved gracefully to desired arc.
5. Hardwoods must be pre-drilled or proper setting equipment must be used.
6. Proper fasteners must be used. Galvanized normally for exterior use. This includes finish nails, screws, hardware etc.
7. All tools must be sharp, adjusted correctly and of high quality. A sixty tooth carbide blade on a ten inch table saw is usually needed for on site ripping of finish grade materials.
8. Use the longest lengths of lumber possible. This is especially important for crown moulding, siding, trims etc.
9. Only journey carpenters with finish experience should work with or install finish quality lumber.
10. Remove all pencil marks etc. before painters apply finish.
11. Clean your hands before working with finishes, wear latex gloves if necessary.
12. Give painters a chance to prime or pre-stain material when possible.

DIVISION SEVEN: THERMAL AND MOISTURE PROTECTION

Roofing

BUILT UP ASPHALT

1. Review plans and specs with foreperson.

2. Insure that nails have been set flush with plywood.
3. Plywood joints that exceed 1/4 inch must be filled or covered.
4. See that all crickets or slopes in roof, drain to roof drains.
5. Make sure there are no low spots in roof.
6. Check that all roof jacks are in place.
7. Any platform or obstruction over 4 feet in length must have a cricket.
8. Verify that tar pot is in good working order and is used safely. Watch that hot tar is dripped on finished products or persons below.
9. Insure that all openings are properly marked and fall protection is in place.
10. Insure that fall protection standards are met.
11. See that all flashing is installed.

Other Roofs

1. Review plans and specs with foreperson.
2. For roofs with tiles, shakes or shingles insure that eaves, edges, shake mould, gutters, fascia, etc. are complete.
3. If fire resistant shakes are used, save bundle tags for proof of chemical treatment.
4. Watch for step shingles and details showing sealing against walls, parapets, chimneys, etc.
5. Check for required flashing.
6. Tile roofs should be loaded one week prior to installation.
7. See that all roofing nails are picked up off the ground each day. These nails are the most common cause for flats on job sites.
8. Insure that fall protection standards are met.
9. Check pneumatic nailers for depth of nail set and approved fasteners. Look for shiners before inspection.

10. See that all subs are complete before applying roofing materials
11. If subs need to walk on tile roofs, inform them that they will be responsible for any damage they may cause.

Insulation

1. See that all surfaces are protected from fireproofing overspray.

DIVISION EIGHT: DOORS & WINDOWS

Doors and Frames

1. Review plans and specs with foreperson.
2. Set frames with door template if possible.
3. Check submittals for framing dimensions for doors and windows.
4. If wood frames are used in metal stud walls, line metal studs with wood framing. If doors are heavy or oversized, install blocks in floor channel to accept door frame bottom screws.
5. Inventory and parcel hardware to door and frame locations in advance of installation to insure missing hardware can be located.
6. Look for floor or wall bumpers, N.R.P. hinges, push plates, spy holes, panic or other special hardware.
7. Watch for handicap requirements. Latces versus knobs, handle elevations, pressure required to open, etc.
8. Adjust closures twice, once at installation, secondly after three weeks or after air balancing.
9. Inspect doors and frames for fire rating tags and compare with requirements of code.
10. Get help, when required, for lifting heavy doors and equipment.
11. See that all one piece frames are on site prior to framing start up.

Division Nine: Finishes

Division Ten: Specialties

Division Eleven: Equipment

1. All trucks with cranes or reaching equipment must stay well away from electrical lines.
2. All equipment must be operated by a qualified person.

Division Twelve: Furnishings

Division Thirteen: Special Construction

Division Fourteen: Conveying Systems

1. Systems must be marked for direction of travel, shut off switch and other safety concerns.

Division Fifteen: Mechanical

1. Insure the same number of curbs are shown on architectural and mechanical details.
2. Make sure plate protectors are installed to protect pipes and conduit.
3. Check submittals! Check lead times for roof units or other large equipment.

Division Sixteen: Electrical

1. Review all specs and plans with electrical foreperson.
2. Watch that electrician does not cut king studs when installing switches near doors and windows.
3. Have an electrician make repairs to electrical wire, equipment, etc. in buildings. Do

your own light-duty repairs to saws, drills etc. if you are capable.

4. Coordinate shut down, lead times and power requirements for job site.
5. Check contract documents to see who supplies temporary power and lighting.
6. Look for possible conflicts of switch or outlet elevations with other trades.
7. See that all circuits, outlets, switches, etc. are labeled as required.

LEADERSHIP TRAINING PROGRAM

“THE SUPER SUPER”

MODULE TEN: “COMPUTER SCHEDULING FOR SUPERINTENDENTS”
“CPM EXERCISE”
“AMENDING AND ADDING TO THE SCHEDULE”
“RESOURCE MANAGEMENT STEPS”
“CUSTOMIZING THE BAR CHART”

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NOTES:

Module 10 Computer Scheduling for Superintendents

THIS CHAPTER IS PLANNED TO PROVIDE ANSWERS TO THE FOLLOWING QUESTIONS:

- **Why is a schedule important to a construction project?**
- **What types of schedules are used in construction?**
- **How does the superintendent use the schedule?**
- **What makes up the different components of the schedule?**

SCHEDULE REVIEW

In this module we will learn to use the computer to assist us in the initial design of a schedule for a construction project. We will also learn how to maintain and update the schedule on an as needed basis.

As you know, the schedule is used for the purpose of planning ahead. Being able to anticipate what will occur in the future allows us to perform our tasks efficiently and on time. Without a schedule we would have chaos on the job site. Sub contractors might arrive whenever they felt like it and tasks would not be done in a logical sequence. Concrete might be poured before installing rebar, for example. Construction companies would not be able to project completion dates and owners would

have no idea when they could use the new premises.

Besides planning for construction sequence, today's computer scheduling programs allow us to incorporate other functions to the schedule. Scheduling software has the capability to cost load and forecast expected expenditures, estimate manpower requirements through resource loading and provide a full compliment of schedule and cost reports and time scale graph presentation including both critical path logic diagrams and bar chart formats.

Is this starting to sound a little complicated? It's really not that bad. In this module we will learn how to load all that information into a schedule. We will take it step by step and you will see that it is not all that difficult. We must remember one thing though, using the schedule

productively is more important than creating the schedule. Construction superintendents have to keep in mind the purpose of the schedule. The purpose is planning ahead. Many superintendents use the schedule to see what they have to do for that day's activities or they record what they accomplished that day. If you ask yourself, "What will I be doing two weeks from today?" you are using the schedule for the purpose it was designed. Another question frequently asked is, "Why do I need a computer schedule?" The answer to that is, it makes it easier to update or change information in the schedule. It also allows the user to add much more information than can normally be displayed with a handwritten schedule.

Can you imagine trying to keep track of 100 different sub contractors and 10,000 different

tasks over a two-year time span by hand? Now add in cost loading, graphic presentation, load leveling, resource allocations, etc. Without the use of a computer we would spend as much time creating and maintaining the schedule as we would building the project.

Later in this module we will be using a scheduling program called FastTrack. The program is made by AEC Software. AEC Software is used by many companies throughout the United States.

GETTING STARTED

The first thing we would need to create a schedule is a set of contract documents for a particular project. This would include a set of blueprints and a Bound Project Manual. We will also need a length of time stipulated as to how long we have to complete the construction project.

In construction, unlike other fields, we are task driven in forming a schedule. We are given a length of time to complete a project and must

provide the resources to do the work. Other projects are resource driven. For example, in creating software only a limited number of programmers and engineers are available. They may not all be available at the same times either. In this case we must extend the length of the project to whatever is necessary, using the available resources, in order to complete the project. Try telling the owner of a building project you will be six months late because you can find only 20 carpenters instead of the required 40, necessary to do the work.

Earliest Start

Task

Resource

Duration

The index will show where the information is displayed.

For this first exercise we are going to create a simple PERT chart that shows **Tasks, Relationships, Resources** and **Durations.**

```

graph LR
    Mobilize[Mobilize] --> TempPower[Temp Power, Fencing, Water and Sanitary Facilities]
    Mobilize --- UBCConst1[UBC Const]
    TempPower --- UBCConst2[UBC Const]
            
```

The first task we started was Mobilize. This involves moving our trailer on site and erecting a job site sign. We assigned a length of time, two days. We also assigned a **Resource**, the

person or company doing the work, which is UBC Const. The **Relationship** that was established is Mobilize first, then we put in our Temporary facilities. This means that:

- **Mobilize is the Predecessor to Temporary Power**
- **Temporary power is the Successor to Mobilize**

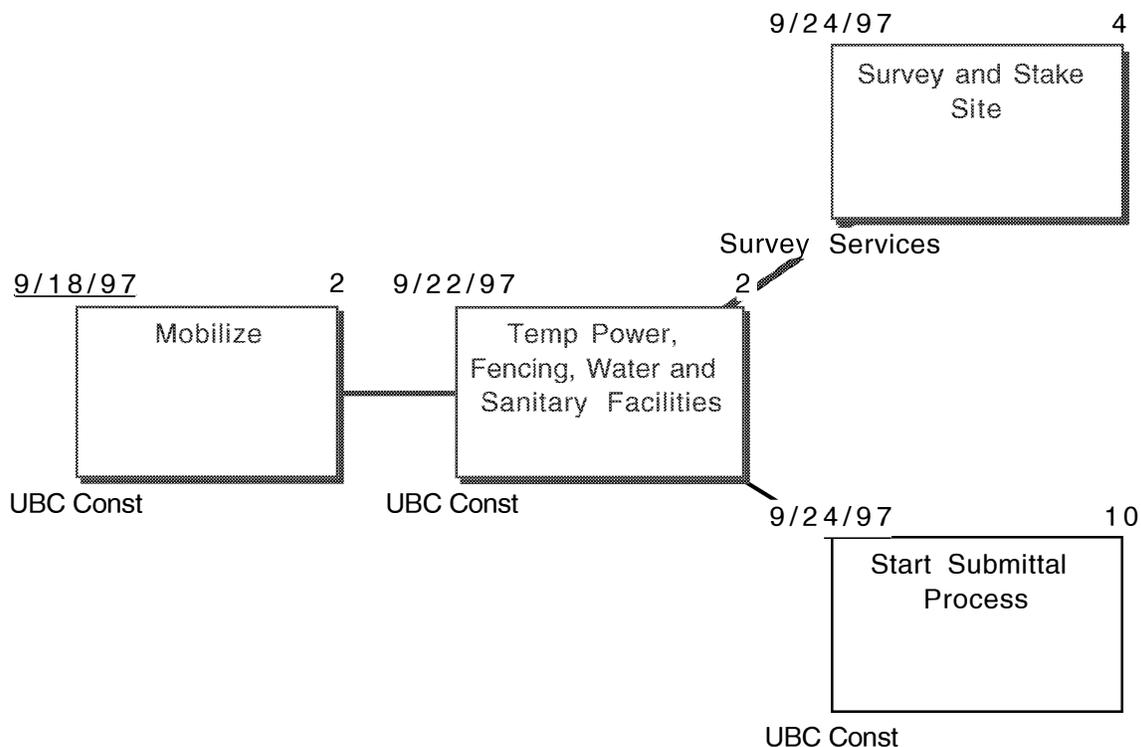
We also assigned a length of two days to complete the work. The **Duration** is shown as the number to the right and above the box.

The **Resource** is the name of the company doing the work. In this instance, Mobilize, the company is UBC Const. The **Resource** is displayed as the name to the lower left, below the box.

The **Start Date** is displayed to the upper left above the box. The computer program automatically displays this date as you fill in the **Duration** and establish the **Relationship** of the two **Tasks**. The program will automatically

account for weekends and holidays and not schedule work on those days.

As we add more **Tasks** to the schedule we must always keep in mind that there is a logical sequence of events involved. For example, we must install rebar before we pour concrete. You can imagine the problem if we tried the reverse. Ask yourself, "After I complete this task, what can I do next?" "So, after we install the temporary facilities, what can we do next? On this project we can start the Site Survey and start the Submittal Process at the same time. Look at how this is displayed in the next diagram.

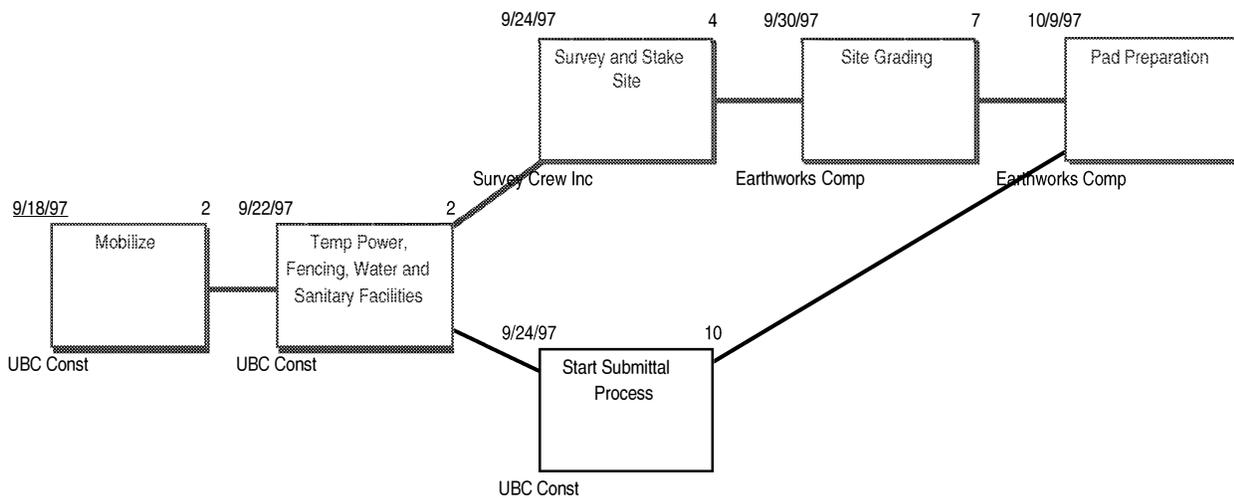


Look at the diagram. You will see that two tasks are now starting at the same time. We can start the site survey and start the submittal process concurrently. However, the two task lengths are different.

How will that affect the start of the **Tasks** that are the **Successors** to these two **Tasks**?

In the next diagram you can see that Survey, Site Grading and Pad Preparation are occurring during the time that the submittal process is

ongoing. The Pad preparation **Task** needs to have submittals reviewed by the architect before it can start. It also needs to have the Site Grading completed before it can start. In this instance the Pad Preparation has two **Predecessors**. The Submittal Process took less time than the total of Survey and Site Grading. Therefore we did not have any down time before we started the Pad preparation.

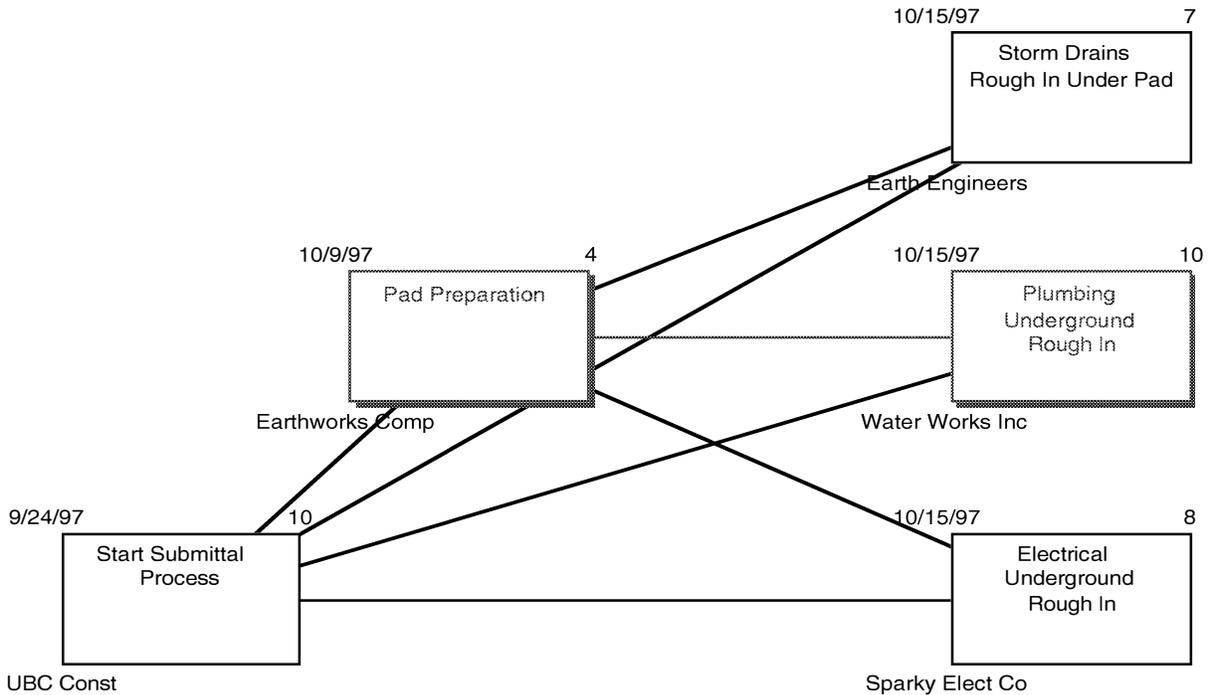


On this project we have several different **Tasks** that can be started once the pad is completed. We have underground for the plumber, the electrician and the site utilities contractor. These sub contractors can all start at the same time. We will have to be careful the sub contractors do not interfere with each other so we may have one start at the south end of the

project while the other works the north end and vice versa. You will notice that the Submittal Process is a **Predecessor** to each of these **Tasks** as the architect must review the material data sheets before any materials are installed. The Pad Preparation must also be completed before each of these **Tasks**. As you can see, each **Task** has the same two **Predecessors**.

Looking at this schedule, we can see that is becoming more intricate. As we add more **Tasks** the **Relationships** will become more

complicated. Trying to keep track of these **Relationships** and **Durations** without the use of a computer would be very difficult.



The simple diagrams we have been looking at could display a great deal more information. We can add **Slack Time, Percentage Complete, Cost, Completion Dates, Earliest Start, Latest Start, Earliest Finish and Latest Finish** to name a few items. As we add each task we simply input the information the computer program asks us for.

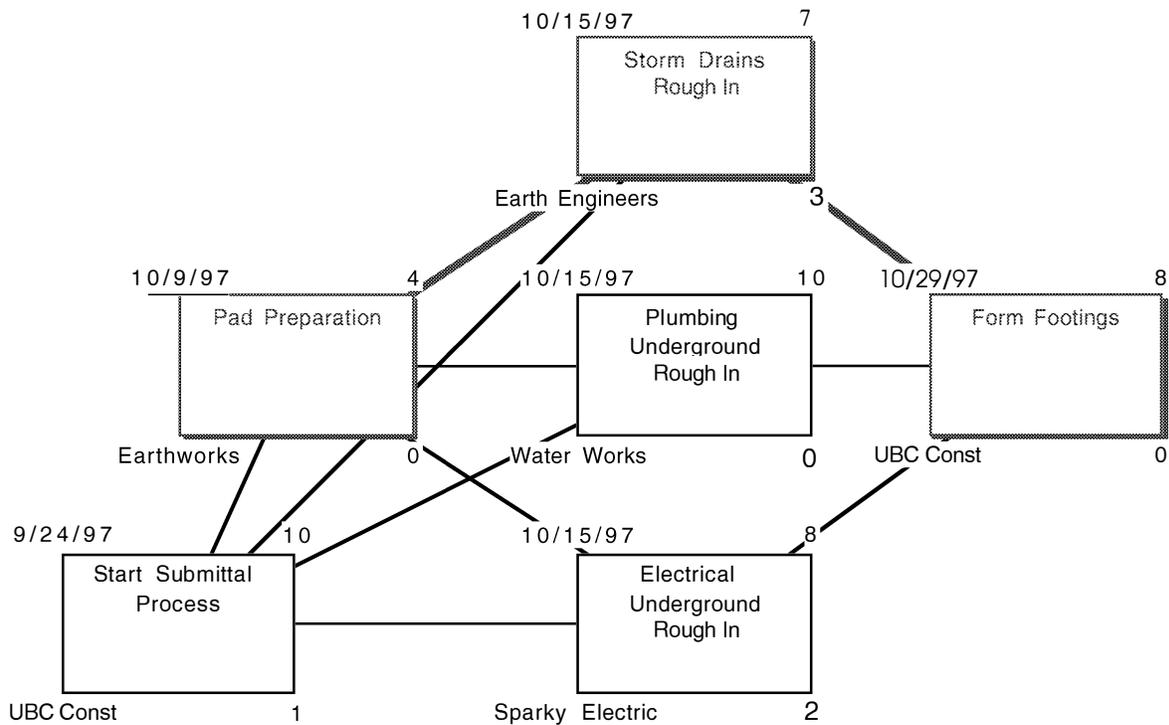
We also have the capability to display other **Task** information we would like. The architect may require more information displayed than the owner of the project. The architect may

want to see all the **Relationships** while the owner may simply want to see when each phase of the project will be complete.

When we put together a schedule that has a large number of **Tasks** and **Relationships** we will find that there are multiple **Tasks** that have the same **Successor**. However these multiple **Tasks** will not necessarily have the same **Duration**. When two or more tasks have the same **Successor**, start at the same time and have different **Durations** we have a situation that creates what is referred to as **Slack**.

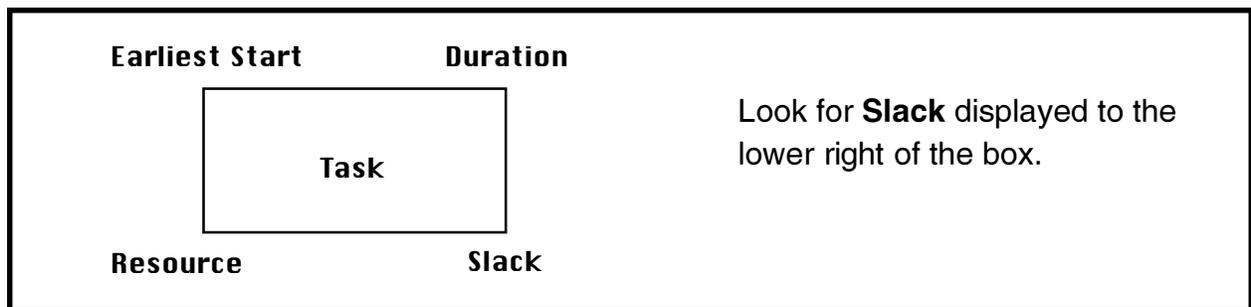
Look at the next diagram. You will see that the Storm Drain Rough In Under Pad, Plumbing Underground Rough In and Electrical

Underground Rough In all start at the same time.



In this diagram there is a number displayed to the lower right, below the box, that represents the **Slack** time. Storm Drains take seven days to complete, Electrical Underground takes eight

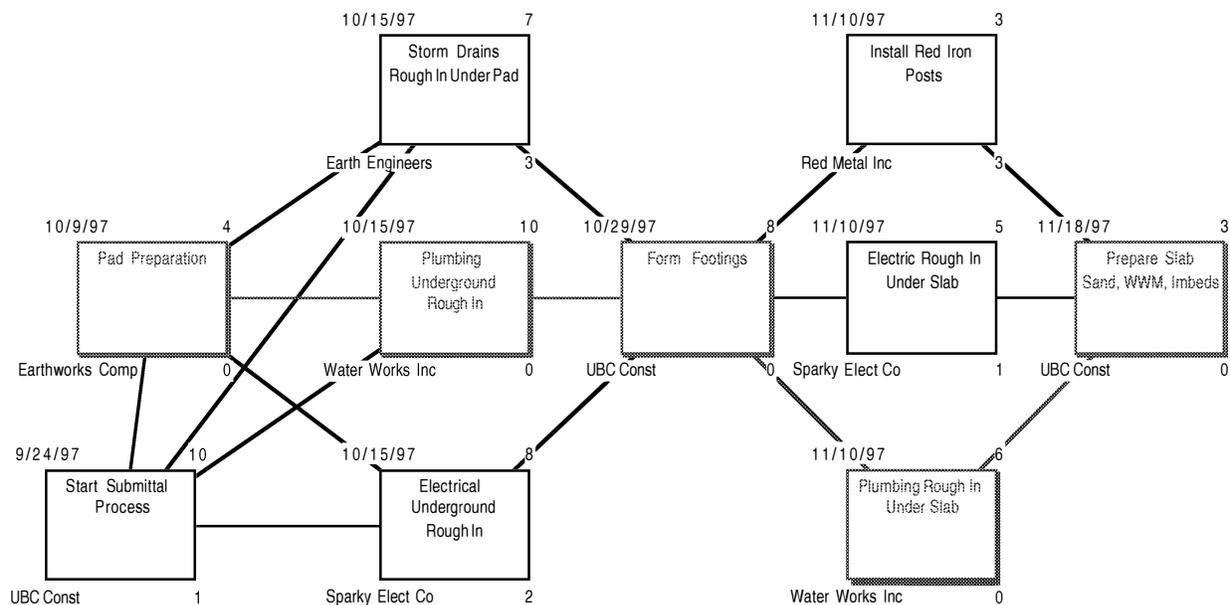
days to complete and Plumbing takes ten days. Therefore Storm Drains can take three days longer to complete and not affect the **Successor**.



- How much more time can the Electrical Underground Rough In take without affecting the schedule?
- Can you think of any circumstances when you would not want to display **Slack** time on your schedule?
- If the Storm drain contractor took eleven days to complete what would happen to the **Slack** time and the schedule?
- Who has the right to use this **Slack** time?

Look carefully at the Diagram below. You will notice that **Tasks** that have zero **Slack** time have a darker line around the box and have a darker line running to the box. This means that the **Task** is on the **Critical Path**. The **Critical Path** is so named because it shows the path of completion critical to the completion of the project in the time allotted. Tasks on this path must be completed within the **Duration** displayed or they will push the completion date

of the project back by the amount of time exceeding the **Duration**. **Tasks** not on the **Critical Path** can be delayed by the amount of time displayed as **Slack** before they impact the completion date. If you add up the **Durations** of all the **Tasks** on the **Critical Path** the sum will be the total length of the project. Unlike most bar charts, the **Critical Path** chart also shows the logic involved in proceeding from one **Task** to the next.



DEFINITION OF SCHEDULING DATES

Activity Date	Description
Early Start	Earliest date activity can begin
Early Finish	Earliest date activity can finish
Late Start	Latest date activity can start without delaying projects finish or an established deadline
Late Finish	Latest date activity can finish without delaying projects finish or an established deadline
Target Start	Target date activity should start; entered by user
Target Finish	Target date activity should finish; entered by user
Start Constraint	Restriction placed on activity's start date that specifies when it can or must start; entered by user
Finish Constraint	Restriction placed on activity's finish date that specifies when it can or must finish; entered by user
Actual Start	Date activity actually started; entered by user, or calculated by SureTrak if estimating progress
Actual Finish	Date activity actually finished; entered by user, or calculated by SureTrak if estimating progress
Suspend Date	Date work on an activity is suspended; requires an actual start date; entered by user
Resume Date	Date work on an activity will or did resume; requires a suspend date; entered by user
Unleveled Start	Date activity was scheduled to start before user leveled resources; calculated by SureTrak
Unleveled Finish	Date activity was scheduled to finish before user leveled resources; calculated by SureTrak

NOTES:

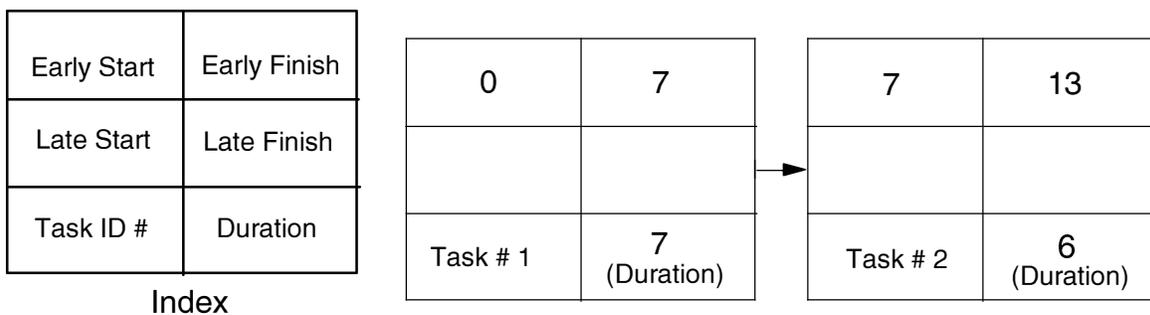
CPM Exercise

FORWARD AND BACKWARD PASS

In this exercise we will look at how the computer assigns **Early Start** and **Late Start** dates to the tasks we put in the computer. We will input the **Predecessor** and **Successor** information and the **Task Length**. What we do not do is assign dates, the computer does that.

The computer first will make a forward pass and figure what is the **Earliest Start** date possible for each **Task** to begin. It does this by adding the **Task Length** of each **Task** to its **Successor**. It takes that total and adds it to each successive **Task**. Look at the illustration below. Note the index. It shows where the **Early Start**, **Early Finish**, **Late Start**, **Late Finish**, **Symbol I.D.** and **Duration** appear in the illustration.

$$(\text{Task 1 Duration}) + (\text{Task 2 Duration}) = \text{Early Finish Task 2}$$



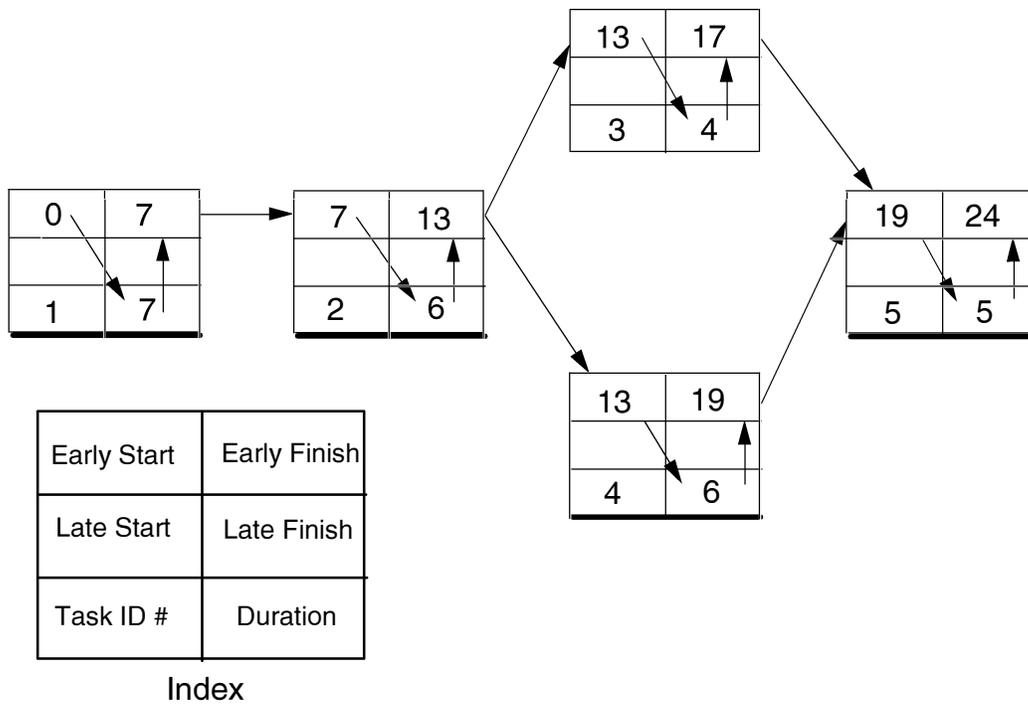
When the computer displays the **Early Start** and **Early Finish** or the **Late Start** and **Late Finish** it is working on a calendar scale. It will take into consideration the days you have specified as non working days, Saturdays and Sundays for instance. It will then compute the **Dates** these events take place. For the purpose of this exercise we will use an arithmetic scale, that is to say we will simply add the number or subtract the numbers from each other.

Look at the next illustration. It shows a simple **Critical Path** chart. Add up the **Task Length** and the **Early Start** and you get the **Early Finish**. When a **Task** has multiple **Predecessors** use the highest **Early Finish** number from all of the **Predecessors**. This is done because the **Task** cannot start until all **Predecessors** are complete.

(Task 1 Duration) + (Task 2 Duration) = Early Finish Task 2

Early Start Task 2 + Duration Task 2 = Early Finish Task 2

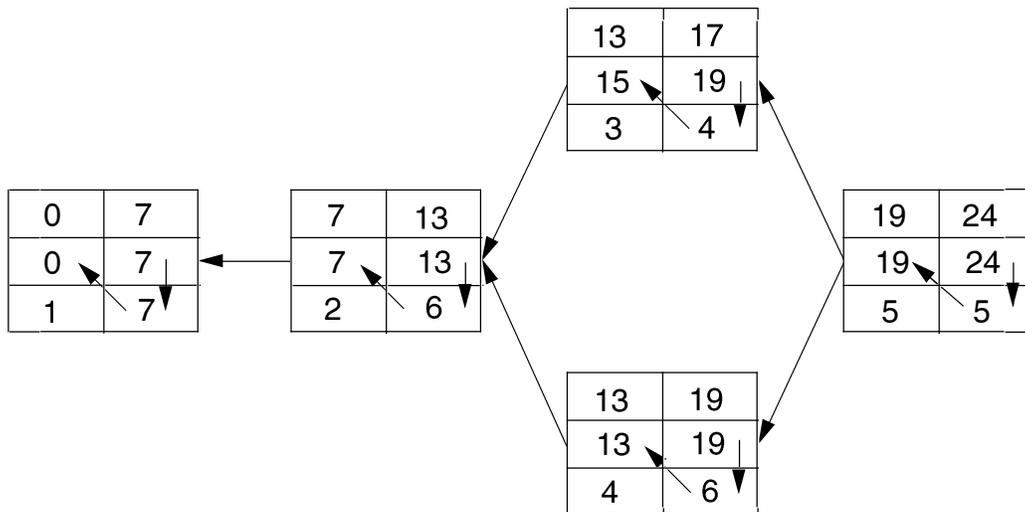
7 + 6 = 13



The computer has been adding the **Task Duration** to the **Early Start** for each **Task** so as to come up with an **Early Finish** for that **Task**. It will do this based on the **Logic** you input by assigning **Predecessors** and **Successors** to each **Task**. The computer must complete this process for the entire project before it can determine the **Late Start and Late Finish**.

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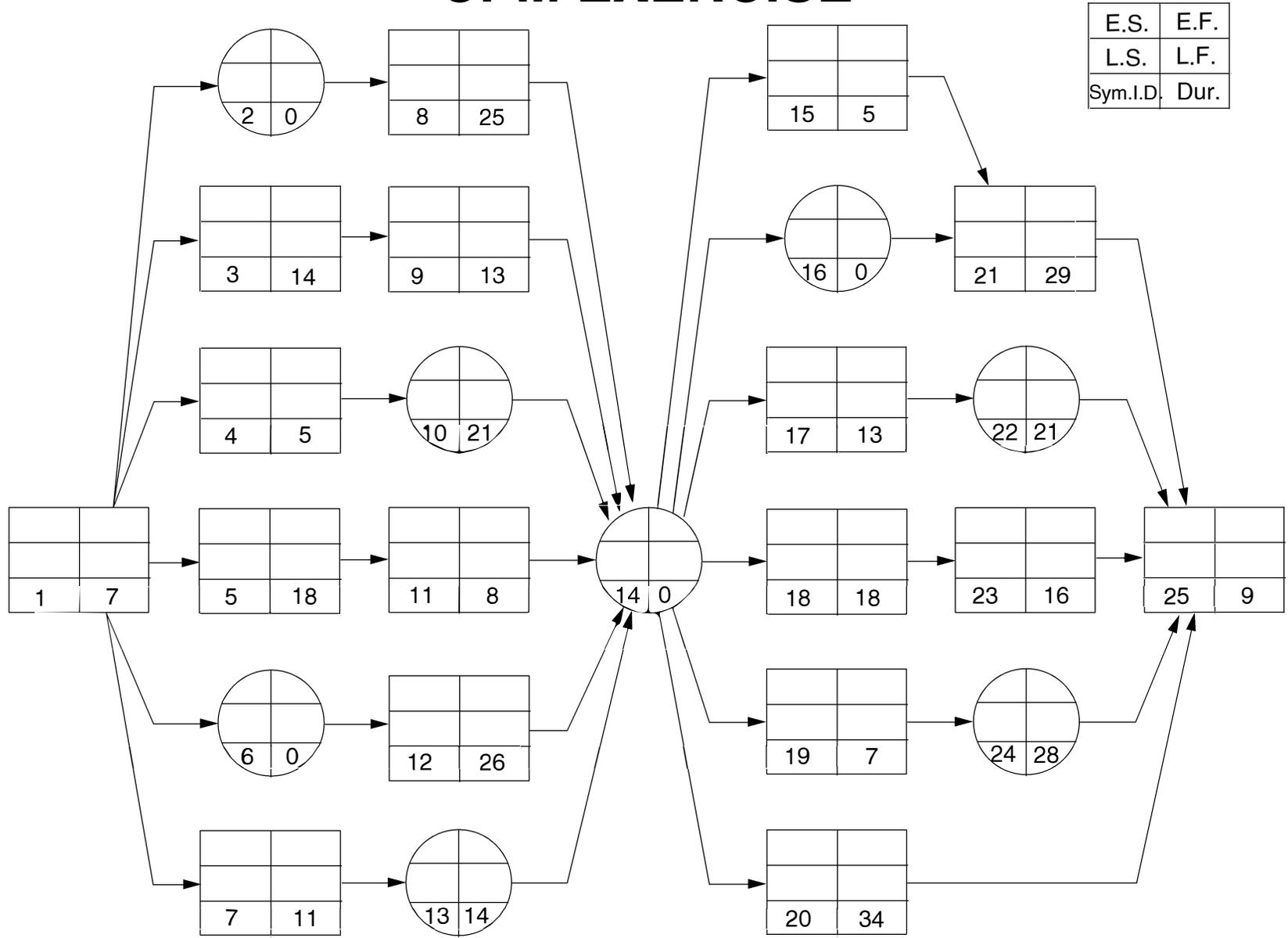
Until now we have been working with a forward pass. Now we will use a backwards pass. To determine the **Late Finish** and the **Late Start** we work in reverse. In the last **Successor Task** take the **Early Finish** and use it as the **Late Finish** for the **Predecessor Task**. When there are multiple **Successors** use the lowest **Early Start** number. Look at the next illustration. When we subtract the **Task Length** from the **Late Finish** we get the **Late Start**.



The computer follows the path of **Logic** you created by looking at the **Successors** and **Predecessors**. In this way the computer is also able to display the **Critical Path**, or the length of time required to complete the project. The computer can now also show which **Tasks** have **Float**. It does this by subtracting the **Early Finish** from the **Late Finish** date. The difference between the **Early Finish** and the **Late Finish** is the **Float**.

Take a look at the **C.P.M. Exercise** and fill out the **Early Start** totals and the **Early Finish** totals for each **Task**. Follow the **Logic** as shown on the diagram. Remember when you get to a **Task** with multiple **Dependencies**, the **Predecessor** with the highest number (or **Early Finish** date) will be the one to use as the **Earliest Start** for the **Successor Task**. When you have completed that, work your way backwards and find the **Late Start** and the **Late Finish** numbers.

CPM EXERCISE



Module 11 Resume for the Construction Superintendent

As a union carpenter you have become used to the system of being dispatched to a new job site. At the site you probably filled in some questionnaires that inquired about your address, phone number, emergency phone contact person, etc. The resume that you provided was your union dispatch.

There has been no need to provide a personally written resume to a contractor until now. There is an ad in the paper, from a local union contractor, looking for a superintendent to run a concrete forming project. This is the same kind of work you have been doing for the last three years.

**WANTED:
Construction Superintendent**

**Union Contractors of
San Francisco**

Is looking for a super to run concrete forming work at Big City Water Works Project. Must have experience, be computer literate, know scheduling, contract documents, HazMat Certs. Excellent Salary and Benefits.

Send Resume to: Fax # 415 555 1212

**Union Contractors of San Francisco
111 Market Street
San Francisco**

Now this is a job right up your alley. You just completed three years of concrete formwork at a water plant in Vallejo. You started out there as a carpenter and ended up as the foreman running the entire carpenter and laborer crew. You got used to doing paperwork for the contractor at the water plant and you have your HazMat Certs from Health and Safety Training through the Carpenters Union. The Leadership Training Classes provided a place to get computer skills. This job has your name written all over it. However, to get the job it looks like you are going to have to provide a resume.

SEND RESUME TO:

- Have you seen that phrase before?
- Have you ever sent out a resume to apply for a job before?
- Have you ever gotten a job from a resume that you sent out?
- Have you ever thought you couldn't get the job, because they asked for a resume?

Well now its time to write a resume. There are a lot of questions you will have to ask yourself before you start this project. There is going to be some research of your personal history and records, which you will have to do. When you have completed the preliminary work you can then start writing the resume. You will have a set of plans to follow to provide direction so as to produce a resume that will allow you to proceed to a job interview.

Resume Plans

- 1. Collect and organize job and skills history**
- 2. Match your experience and skills with contractors needs**
- 3. Emphasize your particular skills**
- 4. Organize information for an effective resume**
- 5. Choose words carefully**
- 6. Resume review**
- 7. Create a masterpiece**
- 8. Review the final product**

1. Collect and organize job and skills history

EDUCATION

List your education:

- Include your High School
- Include special seminars
- Journeylevel Training
- Health and Safety Training
- Night School
- College

Include a brief summary of important training classes you've taken. Note when training and regulations require a certification.

For Example:

I have been certified by the State of California to work in Lead Abatement after completing a 32-hour Health and Safety training class.

EXPERIENCE

Be sure to include:

- Full-time paid jobs
- Part-time jobs
- Volunteer work.

List the month/years you worked, position, name and location of employer or place, and responsibilities you had. Make this list in chronological order, starting with the last job you worked at. Each major job you held should show an increase in skills and responsibilities. As you describe your skills and work activities, ask yourself questions like these:

- Do I meet construction schedules consistently?
- Am I a good communicator?
- Do I enjoy teamwork?
- Have I run work or been a crew leader?

For Example:

4/95 - 3/98 Carpenter Foreman Brero Construction, Santa Clara, CA

My duties included assigning tasks and performance evaluation, keeping time cards, scheduling manpower, equipment and materials. I also maintained communications with sub contractors, the architect, inspector and the owner.

SKILLS

What are you good at?

- Concrete Formwork
- Commercial Framing
- Computer Literacy
- Communication
- Leadership

Describe your skills so as to target the position you are applying for. If the position is construction superintendent you might describe your skills as follows.

For Example:

While working as the carpenter foreman at the water plant, my leadership and communication skills played a large part in delivering the concrete formwork on time and under budget. My experience with modern forming systems allowed our company to achieve manpower budget targets.

AWARDS and HONORS

List your important awards, such as:

- Apprentice of the Year 1989
- Medal of Valor
- Scholarship

When you have completed getting this information together and written down, check it for accuracy. You'll need correct names, addresses, correct and consistent dates, and correct spelling.

2. Match your experience and skills with the contractor's job requirements

Job Title or Position

- What is the ideal job you are searching for?
- Now get realistic and list what positions you would accept
- Ask yourself; do I have the skills to perform the job?

Now look for the positions you listed. Check newspaper want ads, tell your employer and former employers what positions you are looking for. Inform your local hall you would like to be dispatched as a foreman or as a superintendent. The Internet has several job search sites and can also help find positions.

The Contractor

As a superintendent or foreman, what aspects of your education, experience, or skills will be most attractive to that employer? List specific job experience, areas of specialty, specific skills, or knowledge that you think would interest the employer.

3. Highlight Details That Demonstrate Your Capabilities

Review what you've written and try to select details of your education, experience, honors, skills, and activities that match the contractor's needs in a few important areas.

For Example:

When applying for superintendent position at a company that specializes in wood frame construction, highlight all the framing positions that you held. Also highlight any supervisory positions.

4. Organize the Resume Effectively

PERSONAL INFORMATION:

Your Name {top center, first page }

Address

Phone number

E-mail and/or Fax #

EDUCATION:

List your education, include seminars, special training, certificated courses

EXPERIENCE:

In the construction trades we use a chronological format to list our work experiences To emphasize work experience, list jobs beginning with the most recent. Some hints:

- Write all job descriptions in parallel phrases, using ACTION verbs
- List the most important responsibilities or successes first
- List similar experiences and skills together
- Emphasize collaborative or group-related tasks

NOTE: A potential employer has no legal right to request information about age, sex, race, religion, marital status, health, physical appearance, or personal habits. Don't include such information on your resume.

AWARDS/HONORS:

Use reverse chronological order; include titles, places, dates.

ACTIVITIES:

Generally, list hobbies, travel, or languages only if they relate to your job interests. In some cases, you may wish to emphasize your willingness to travel or relocate.

REFERENCES:

You need not put these on your resume. Instead, you can prepare a separate list of references, with complete name, title, company name, address, and telephone numbers for each individual. Usually, you give this list to prospective employers after your interview.

5. Consider Word Choice Carefully

In a resume, you need to sound positive and confident: neither too aggressive, nor overly modest. The following words and phrases are intended as suggestions for thinking about your experience and abilities.

Whatever your final word choices are, they should accurately describe you--your skills, talents, and experience.

Choose **ACTIVE VERBS** that describe your skills, abilities, and accomplishments. Examples: I can contribute, enjoy creating, and have experience in coordinating. While at XYZ Construction Company, I administered, coordinated, directed, participated in.... Below is a list of such verbs:

- Accomplish; achieve; analyze; adapt; balance; collaborate; coordinate; communicate; compile; conduct; contribute;
- Complete; create; delegate direct; establish; expand; improve; implement; invent; increase; initiate; instruct; lead;
- Organize; participate; perform; present; propose; reorganize; research; set up; supervise; support; train; travel;
- Work (effectively, with others)

For Example:

You can change the forms of any of these verbs to stress different aspects of your abilities and experience: coordinate

Coordinated, coordinating, coordination.

Choose **ADJECTIVES** and **NOUNS** that describe you positively and accurately:

- Able to; administrative; analytical; (fluently) bilingual; broad scope; capable; communication skills; collaboration;
- Collaborative; consistent; competent; complete; creative; dedicated; diversified; effective; experienced; efficient;
- Extensive; exceptional; flexible; global; handle stress; imaginative; intensive; in-depth; innovative; integrated; able to
- Listen; motivated; multilingual; multi-disciplinary; a negotiator; other cultures; reliable; responsible; a supervisor;
- Teamwork; well traveled; work well with....

6. Ask Other People to Comment on Your Resume

Before you print up your resume, ask someone to critique the document. An advisor, potential employer, or someone in your field is a good choice.

Try calling some local contractors and ask which resumes have impressed them in the past. Ask for specific details. Try to incorporate some of these ideas in your own resume.

7. Make the Final Product Presentable

Use a computer and high quality (preferably laser) printer. If you don't have a computer or laser printer, you should either have your resume professionally produced, at your local print shop, or inquire as to where one is available.

- Use a high quality paper.
- Use a laser printer* Use a simple and clear font

8. Evaluate Your Resume

Place your resume on the table, step back and see how it looks. Is the page too busy with different type styles, sizes, lines, or boxes? Is the information spaced well, not crowded on the page? Is there too much “white space”? Is important information quick and easily found?

CONTENT

- Name is at the top of the page: highlighted by slightly larger type size, bolding, and/or underlining
- Address and phone number(s) are complete and correct, with zip and area codes, and are well-placed in relation to name
- All entries highlight a capability or accomplishment
- Descriptions use active verbs, and verb tense is consistent; current job is in present tense; past jobs are in past tense
- Repetition of words or phrases is kept to a minimum
- Capitalization, punctuation, and date formats are consistent
- There are NO typos or spelling errors

ORGANIZATION

- Your best assets, whether education, experience, or skills, are listed first
- The page can be easily reviewed: categories are clear and the text is indented
- The dates of employment are easy to find and consistently formatted
- Your name is printed at the top of each page

FORMAT/DESIGN

- No more than two typestyles appear; typestyles are conservative
- Holding, italics, and capitalization are used minimally and consistently
- Margins and line spacing keep the page from looking too crowded
- Printing is on one side of the sheet only, on high-quality bond--white or off-white
- The reproduction is good, with no blurring, stray marks, or faint letters
- The right side of the page is in “ragged” format, not right-justified.
- Right justification creates awkward white spaces

Now you're done! Just one more suggestion: If you are sending your resume to a prospective contractor, you'll probably also have to include a separate cover letter. This is usually one page long. The letter indicates your interest in a particular company or position, summarizes the most important aspects of your education and experience, and lets the employer know where and when you can be contacted for an interview.

Resumes Do's and Don'ts

Never

- Give a reason for leaving a job. In almost all cases the contractor will find negative connotations to good explanations
- Include hobbies, sports and social activities
- List in your experience technologies for which you have no work experience
- State "References Available on Request." It is assumed, and only clutters up the resume. Other things to omit are your Social Security number, your spouses' occupation and your personal philosophies
- Use exact dates. Months and years are sufficient
- Include the date your resume was prepared. If your job search takes longer than a few months, the resume will appear outdated
- Reveal your company-phone number unless your supervisor is aware of your departure
- Include your height, weight or remarks about your physical appearance or health
- Use professional jargon unless you are sure it will be read by someone who understands the buzz words
- Provide salary information on the resume. Save it for the interview. If you are required to give that information, reveal it in the cover letter
- LIE

Resumes Do's and Don'ts

Always

- Update your resume as you approach completion of each temporary assignment
- Use “bullet” format where appropriate
- Use conventional English. Stay away from multi-syllable words when a one or two syllable word will do
- Use short paragraphs, no more than five lines
- Make sure the resume and cover letter are error free. Proofread and have others proof it for you
- Rewrite a resume for a specific position with a specific company. It is extra work but it may pay off
- Include your significant contributions at each one of your jobs
- Allow the most space for the positions that are most relevant to the position you are applying for
- List your activity with professional, trade and civic associations----only if they are related to the position
- Keep a permanent file of your achievements, no matter how inconsequential they may appear to be. This is the basis for a good resume
- Give each of your references a copy of your resume
- Re-read your resume before each interview
- Send your resume in the timeliest manner possible. Fax or E-mail your resume when possible
-





Foundations for **S**afety **L**eadership

Student Handout

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FOUNDATIONAL MATERIAL

Foundations for Safety Leadership

2

Goal

Introduce you to 5 critical safety leadership skills you can use to improve safety climate and safety outcomes on the job site.

Foundations for Safety Leadership

3

Learning Objectives

By the end of this module students will be able to:

1. Explain why safety leadership is important
2. Describe 5 skills of safety leaders
3. Discuss how to apply safety leadership skills on the job site

SLIDES 4 AND 5 INTENTIONALLY LEFT OUT

Foundations for Safety Leadership

6

Who are Safety Leaders?

-
-
-
-
-



Foundations for Safety Leadership

7



Foundations for Safety Leadership

8

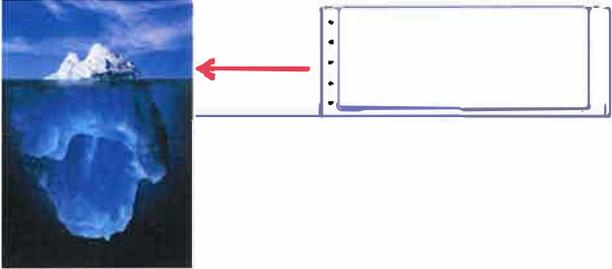
Safety Leaders Strengthen Jobsite Safety Climate

How well a company's policies, procedures, and practices are actually implemented on the job site.

Foundations for Safety Leadership

9

Direct Costs

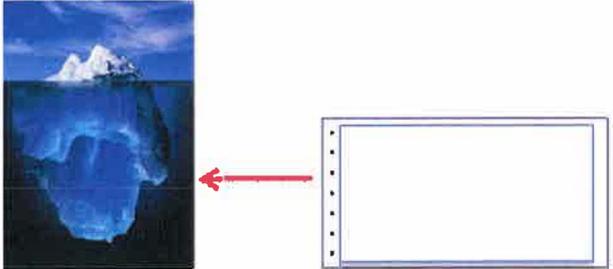


The slide features an iceberg image where the small tip above the water represents direct costs, and the much larger submerged part represents indirect costs. A red arrow points from a rectangular text box on the right towards the tip of the iceberg.

Foundations for Safety Leadership

10

Indirect Costs



The slide features an iceberg image where the small tip above the water represents direct costs, and the much larger submerged part represents indirect costs. A red arrow points from a rectangular text box on the right towards the submerged part of the iceberg.

Foundations for Safety Leadership

11

Benefits of Effective Safety Leadership



A large rectangular text box is provided for listing the benefits of effective safety leadership.

Safety Leadership Skills

Foundations for Safety Leadership

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Safety leader is defined as...

A person who has the **courage** to demonstrate that s/he values safety by working and communicating with team members to identify and limit hazardous situations even in the presence of other job pressures such as scheduling and costs.

Foundations for Safety Leadership

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5 LEADERSHIP Skills

Leads by example

Engages and empowers team members

Actively listens and practices three-way communication

Develops team members through teaching, coaching, & feedback

Recognizes team members for a job well done

LEADER

Leads by Example

Foundations for Safety Leadership



14

How to Lead by Example

- Have a positive attitude about safety
- Establish safety as a core value
- Set high expectations for safety
- Share safety vision with the team
- “Walk the talk”
- Reinforce the idea that *everyone owns safety*
- Lead up!

LEADER

Engages and Empowers Team Members

Foundations for Safety Leadership

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How to

Engage and Empower Team Members

- Explain why safety is critical to getting the job done
- Engage team members in safety decision-making
- Conduct daily morning safety huddles and joint worker-management walk-arounds throughout the workday
- Empower team members to
 - Report safety concerns, injuries and near misses
 - Report or fix hazards or unsafe situations



LEADER

Actively Listens and Practices 3-Way Communication

Foundations for Safety Leadership



Actively listen

How to Actively listen and Practice 3-way Communication

16

- Treat team members with respect when they are speaking
- Pay attention to non-verbal cues such as body language and eye contact
- Listen to **hear** what is being said vs. to come up with a response.
- Ask clarifying questions

Foundations for Safety Leadership



17

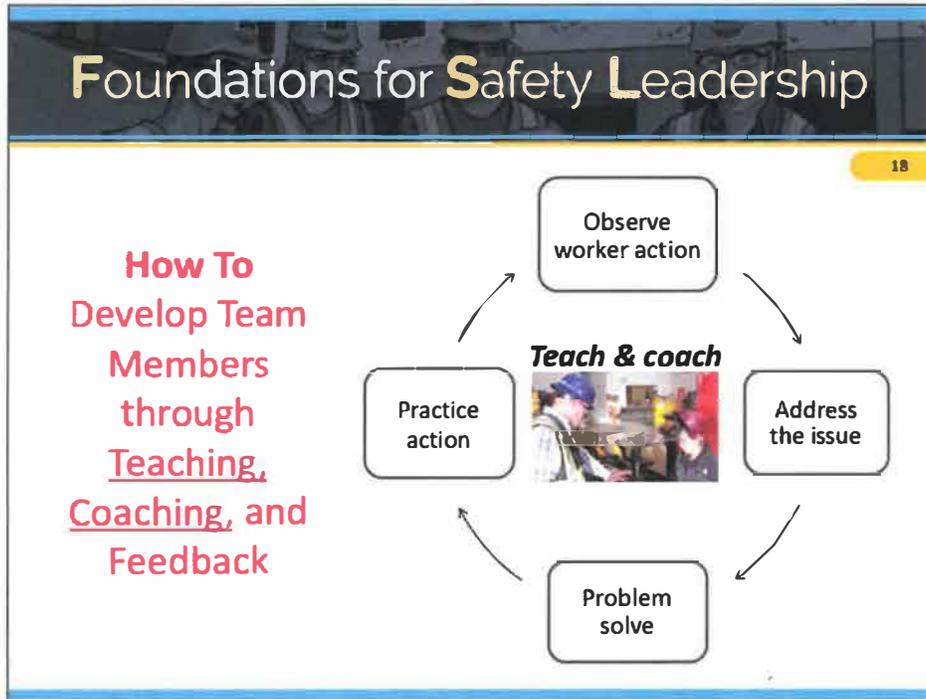
How to Actively Listen and Practice 3-way Communication

**Practice 3-way
communication**

- Make sure you have listener's attention
- Be direct and concise
- Ask team member to repeat message
- Clarify any misunderstandings

LEADER

DEvelops Team Members through Teaching, Coaching, and Feedback



Foundations for Safety Leadership

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**How To
Develop Team
Members
through
Teaching,
Coaching, and
Feedback**

*Use the **FIST** Principle:*

Describe the **F**ACTS
Explain the **I**MPACT
Provide **S**UGGESTIONS
Be **T**IMELY

LEADER

Recognizes Team Members for a Job Well Done

Foundations for Safety Leadership

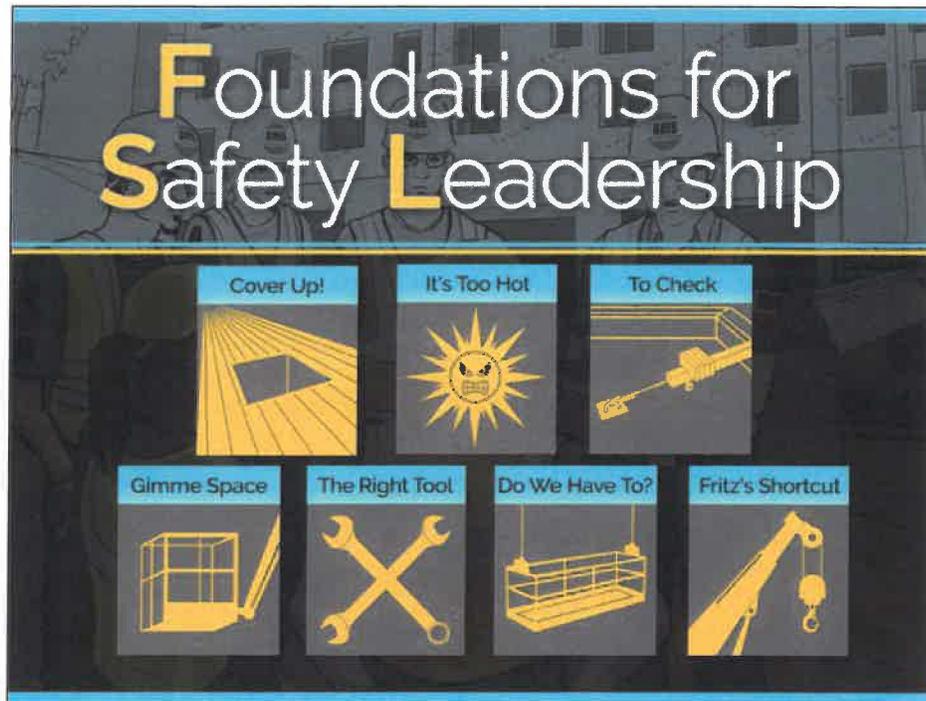
20



How to Recognize Team Members for a Job Well Done

- Give recognition separately from other types of feedback
- Regularly give praise in private
- Be specific about why you are praising the person
- Give praise publically if the person is comfortable with it

Applying Leadership Skills in Real World Scenarios



Foundations for Safety Leadership

22

Scenario Activities

- Analyze whether characters used the safety leadership skills
- Discuss what could have been done better

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Scenario Structure

- Situation
- Outcome A
- Outcome B
- First letter of character's name based on job position:
 - Stan is a Superintendent
 - Frank is a Foreman
 - Emilio is an Experienced worker
 - Tia is a Trainee/apprentice

Construction site where all the scenarios take place

Foundations for Safety Leadership

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Job site

- Six-story mixed use building (1st floor commercial)
- North Carolina
- 12-14 month project
- Began in January, scenarios start in July

General Contractor

- American Master Builders (AMB) Inc.
- 50% AMB employees
- 50% specialty subs
- 30-50 workers on site at any one time
- Union and non-union

Leadership Skills and Action Checklist

Skills	Actions
Leads by Example	<ul style="list-style-type: none"> • Establishes safety expectations as a core value • Shares safety vision with team members • Demonstrates a positive attitude about safety • Walks the Talk • Leads up
Engages and Empowers Team Members	<p>Engages, encourages, and empowers team members to identify and act upon unsafe situations by...</p> <ul style="list-style-type: none"> • Reporting hazards and safety concerns • Providing solutions • Reporting near misses • Stopping work if necessary
Actively Listens and Practices 3-way Communication	<ul style="list-style-type: none"> • Actively listens to hear what team members are saying • Practices 3-way communication by having person repeat the message they heard
DEvelops Team Members Through Teaching, Coaching, and Feedback	<ul style="list-style-type: none"> • Respectfully teaches and coaches workers • Watches the learner fix the hazardous situation or perform the task to make sure it's done correctly • Focuses on potential consequences rather than on the team member • Uses the FIST principle: Facts, Impact, Suggestions, Timely
Recognizes Team Members for a Job Well Done	<ul style="list-style-type: none"> • Privately and/or publicly acknowledges team members for going above and beyond when it comes to safety

1. COVER UP!

Stan – *Volt Electric* Superintendent
Frank – *Volt Electric* Lead Foreman
Tia – *Volt Electric* Trainee/apprentice

Situation

To perform her tasks, Tia, a trainee with Volt Electric, has to walk by a large hole in the floor where some damaged plywood needs to be replaced. Stan, Volt's superintendent, knows it's a serious fall hazard that needs to be addressed immediately. The GC has been slow to respond to safety requests, so he asks his lead foreman, Frank, to take care of it.

Outcome A

Frank tells Tia she needs to cover the hole in the floor. Tia nods and decides she'll take care of it in 15 minutes when she's done securing the electrical wire to the stud. She knows Frank hates it when one person holds up someone else's work.

Meanwhile, two drywall installers don't see the hole until the last minute when a nearby worker yells, "Stop!" which gives them just enough time to avoid it.

Frank gets word of this, goes back over to Tia, and yells at her for not covering the hole immediately. He adds that if the worker had stepped into the hole, she would have been seriously injured, or maybe worse, and points out that this isn't the first time she's ignored his instructions. Tia, feeling humiliated, apologizes and explains that she didn't realize he wanted her to drop everything.

Outcome B

Frank tells Tia she needs to cover the hole in the floor immediately because it's a serious fall hazard. He tells her to stop what she's doing, get a piece of plywood, secure it over the hole, and spray paint the word "hole" on it. He reminds her to tie off so she won't become a victim while fixing the problem.

When he's finished, he asks her to repeat his instructions to make sure they're on the same page. Tia repeats Frank's instructions word for word and Frank gives her the thumbs-up.

When she's done covering the hole, Tia thinks how glad she is Frank asked her to confirm what he wanted her to do and by when he wanted it done because there have been times when she hasn't understood exactly what other foremen she's worked with were asking her to do.

A few minutes later, when Frank comes by to thank Tia for removing the fall hazard, two drywall installers walk across the piece of plywood she just put down.

2. IT'S TOO HOT, TOO HOT, TOO HOT BABY...

Franco – *AMB, Inc.* Foreman
Emilio – *AMB, Inc.* Experienced worker

Situation

Late one afternoon, Franco, a foreman for AMB, notices Emilio, an experienced carpenter, pouring a jug of water over his head. Franco suspects heat exhaustion.

He shouts to Emilio that he'll be right down to walk him to the trailer where it's cool, so he can rest, get something to eat and drink, and stay inside, out of the sun, until quitting time.

Emilio responds that he's fine, except for a slight head and stomach ache. But agrees to go to the trailer.

Outcome A

After guzzling a sports drink and eating some peanuts, Emilio notices it's 2:00 and thinks if he gets back to work soon, he can finish what he was doing before the day ends. So, he leaves the trailer to go back to work.

The sweltering heat hits him as he leaves and soon he is overcome with nausea. He gets a leg cramp, his knee buckles, and he drops to the ground. Franco sees this and runs over to see if he's ok.

Emilio's wave of nausea subsides and he tells Franco not to worry, it was "just a little cramp." Franco tells Emilio his instructions were very clear to sit out the rest of the day and that he should have listened to him.

Outcome B

Franco asks Emilio to tell him exactly what he's going to do once he gets into the trailer. Emilio repeats Franco's instructions, but leaves out the part about stopping work for the day.

Franco corrects him and emphasizes that he expects him to stay and rest in the trailer until quitting time. Emilio frowns, saying it will only take him a few minutes to finish what he was doing.

Franco tells Emilio that the only job he has left to do today is to get better for tomorrow and that another crew member will be able to finish up for him. Emilio knows that Franco is doing this because he's concerned, so he explains what's left to do, and heads to the trailer.

3. TO CHECK OR NOT TO CHECK...

Finn – *AMB Inc.* General Foreman
Enzo – *AMB Inc.* Experienced glazier
Erika – *AMB Inc.* Experienced glazier
Scott – *TJ's Roofing Site* superintendent

Situation

It's 7 a.m. in early August. Five *AMB Inc.* glaziers and the foreman, Finn, are in their daily safety huddle. Finn goes over the day's tasks of installing windows from a suspended scaffold and talks about possible safety issues. When he finishes, he asks if anyone has anything else to discuss before starting work.

The workers look at each other, and Erika speaks up, saying she's concerned about tiebacks for the suspended scaffold. She'd heard *TJ's Roofing* is undoing them and the lifelines because they think they'll get their work done faster.

Outcome A

Finn thanks Erika for letting him know and says Ok, if there's nothing else, let's get to work. On the job, Erika inspects the suspended scaffold tiebacks and notices that one isn't secure. So she fixes it before starting work.

Outcome B

Finn is surprised and asks if anyone else heard this – or seen it happen. The workers nod and Enzo says yesterday he saw someone on a suspended scaffold that didn't have the tiebacks secured.

Finn gets angry and says to the crew that if the tiebacks aren't attached, and something compromises the scaffold, the rigging devices can move which will put us all out of work while ambulances take care of the mess.

He thanks both Erica and Enzo for paying attention to hazards and for speaking up, and says he's going to talk to the sub's supervisor immediately before any of them go on the site.

Finn, Erika, and Enzo leave and run into Scott, *TJ's* site supervisor. As Finn tells Scott about his crew's concerns, Scott gets defensive, exclaiming that he and his crew always put safety first! Although he also admits he's getting pressure from the owner because there's another job starting next week.

In a raised voice, Finn says to Scott that he's putting workers' lives at risk, and that he won't stand for it. He tells Scott that until he calls his crew together and tells them directly that they should never disconnect any suspended scaffold tieback or lifeline, he won't allow his workers to go on site which will not only delay *TJ's* work on this project, but also the one starting next week.

Scott glares at Finn but then gathers his workers and to say tells them never to untie any suspended scaffold tiebacks and or lifelines. He goes on to say that if they find any unsecured connections they must let him know so he can make sure the problem is immediately fixed.

4. GIMME SOME SPACE...

Simon – *Burnett* Superintendent
Freddy – *Burnett Insulation* Foreman
Eli – *Burnett Insulation* Experienced worker
Ted – *Burnett Insulation* Trainee/apprentice

Situation

Simon, the superintendent for Burnett Insulation, checks on his crew, asks them how it's going and if they need anything to complete their work. No one comments at first, until the trainee/apprentice, Ted, says that everything is fine. Simon notices the other workers aren't looking at him.

Outcome A

Simon disregards the lack of eye contact and turns to leave, saying ok, and asks them to let him know if they need anything.

Outcome B

Rather than taking Ted's word for it, Simon asks the crew to walk him through their plans for the day, including any safety issues that might come up.

Fred, Burnett's foreman, says they're supposed to insulate the copper pipes in the ceiling. But, because the pipes are in a tight space close to electrical wires, they can't set-up their ladder correctly and will have work in awkward positions.

Simon thanks the crew for identifying the problems ahead of time, rather than starting work and getting in a bind. He agrees that the last thing they want to do is damage the wiring and delay the project. And he's sure no one wants any more back strains.

Simon's positive response encourages Eli to chime in, saying that they found a few places they could get in opposite the pipes, but they can't figure out how to reach most of the other spots.

Simon asks them to think about other types of equipment that might work better than a ladder. The crew suggests a scissor lift, an articulating boom, or a one-man vertical lift. Simon comments they are all great ideas but the best one is a one-man lift because it will fit the space, they can take all their materials with them and they won't have to bend and twist to get the work done.

He tells them that there's one on the first floor and asks Ted to get it. He then turns to Fred and asks him to write up a short paragraph on their plan and put it in the JHA binder in case they're in the same situation again.

5. THE RIGHT TOOL FOR THE RIGHT JOB

Felicia – AMB Foreman & Co-Owner

Eric – AMB Experienced worker

Tyler – AMB Trainee/apprentice

Situation

Felicia, foreman and co-owner of *AMB Inc.* sees Eric, an experienced carpenter, using an open-ended wrench to tighten bolts on a ledger board above the delivery door opening where they will install an awning. As company owner, she knows she plays a key role in reducing jobsite risks. So, she decides to ask Eric why he's not using a tool that would be less likely to slip, like a ratchet or box wrench.

Eric agrees with Felicia that either one of those tools would be safer, but says the wrench was close by and he just wants to finish up and move on. Felicia raises her voice slightly, saying that at AMB safety is our number one value and that Eric needs to find and use the right tool to finish the job.

Eric goes to the gang box, doesn't see a ratchet or box wrench, and decides to continue using the open-ended wrench.

Outcome A

Tyler, a trainee at AMB, overhears Felicia speaking with Eric and mutters to himself that Eric always talks about working safely, but it looks like he doesn't really mean it.

Outcome B

Tyler sees that Eric is still using the wrench but he isn't comfortable challenging him. He then remembers seeing a ratchet on the ground. So he goes to get it.

He hands the ratchet to Eric and asks if it's what he was looking for. Eric thanks him. Tyler grins, says it was no problem and that he'd hate to see Eric bust up his pretty face with that open-ended wrench. Felicia happens to see their interaction.

Later, Felicia thanks Tyler for his extra effort and asks if it would be ok if she mentions it at the next safety huddle. Tyler says he'd prefer to not be singled out, but is glad to know that she appreciates what he did and thinks Eric does too, although he might not say so!

Felicia agrees she won't mention it, but says that she will speak with Eric and tell him that now on she expects him to take his role as a safety leader seriously which includes leading by example.

6. DO WE HAVE TO??

Floyd – *Painting Perfection* Foreman
Ed – *Painting Perfection* Experienced worker
Tom – *Painting Perfection* Trainee/apprentice
Tina - *Painting Perfection* Trainee/apprentice

Situation

Floyd, foreman for Painting Perfection, sees Ed, an experienced painter, along with trainees Tom and Tina, starting to load their materials onto the suspended scaffold. Floyd asks Ed if they've inspected the rigging on the roof to make sure the scaffold is secure.

Ed snaps back, saying they'd checked it this morning and were only gone 45 minutes. Tom chimes in, saying he's sure the rigging is fine, adding that it's probably 120 degrees on the roof!

Outcome A

Floyd shrugs, saying one check in the morning is probably okay. Ed tells Tom and Tina to hurry and finish loading the materials so maybe they can knock off a little early.

They finish loading the scaffold with enough supplies so they won't have to come down and get more. But at four feet off the ground, one of the riggings on the roof gives way causing the scaffold to tip – taking them and their materials with it. Fortunately, no one is hurt, but it will cost the company both time and money, making Floyd and the CEO very unhappy.

Outcome B

Tom and Ed's reaction makes Floyd wonder if they actually know how to inspect rigging and make needed corrections. Or worse, maybe they think it's okay to cut corners. He tells them that even though it's hot on the roof, the scaffold rigging is what's keeping them from falling and it must be checked! Ed groans when Floyd tells him to get Tom and Tina so all of them can go up to the roof. They all groan when he asks them to come with him to the roof.

On the roof, Floyd asks them to check the rigging. After a minute or so, Ed admits that they're not 100% sure what to look for because they've always trusted others to check.

Rather than being mad, Floyd thanks him for being honest. He then carefully goes over all the OSHA rules and manufacturer's recommendations for securing a suspended scaffold. When he's done, he asks them to take turns repeating the rules and demonstrating how to inspect the rigging.

As they leave the roof, Floyd tells them again how much he appreciates them for not pretending to know how to do something, particularly when it could have such serious safety consequences. Then, Floyd is surprised when Tina thanks him for recognizing their value as team members and for letting them know.

7. FRITZ TAKES A SHORTCUT

Fritz – *Mighty Mechanical* Foreman
Elliot – *Mighty Mechanical* Experienced worker

Situation

The crane operator gave Fritz, *Mighty Mechanical*'s foreman the wire rope slings and shackles they will need to lift 2 HVAC units to the roof and Fritz gave them to Elliot an experienced worker.

While inspecting the equipment, Elliot notices that one sling is severely kinked and a shackle is damaged. So he tells Fritz they should ask the crane operator for replacements.

Fritz knows that getting replacements would take hours and earlier he caught hell from the GC about the tight timeline. So he tells Elliot to go with what they have.

Elliot tells Fritz that he is not comfortable with the decision to proceed with the current rigging equipment because it will create a really unsafe situation. Fritz reminds him that as his foreman Elliot just needs to do what he says.

As one of the units is lifted, the kinked sling abruptly stretches, one end of the unit drops 6 inches, and the damaged shackle breaks open causing the unit to fall to the ground severely damaging it and nearly crushing a worker.

Outcome A

Later, Fritz tells Elliot not to mention the damaged rigging equipment to anyone. Elliot is angry about Fritz's request, but he wants to keep his job.

Outcome B

Later, Fritz tells Elliot he was right to question his decision and says he did it because the GC has been pressuring him. But if that worker had been crushed because of his bad decision he couldn't have lived with himself.

Fritz calls for a safety stand-down. He repeats to the crew what he told Elliot adding that from now on he's going to hold a daily safety huddle to discuss the day's tasks and how to eliminate hazards that may come-up.

He says he has learned the hard way to listen to his crew's safety concerns and expects everyone to report unsafe situations. Fritz ends by saying that he doesn't want to lose any of them due to poor decisions, pride or ego ... some of the bad behaviors he displayed today.

TAKEAWAYS

Foundations for Safety Leadership

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Takeaways

- It takes **COURAGE** to be a leader
- It takes **COURAGE** to speak up
- These skills can easily be inserted into the daily workflow and productivity will not be effected.
- Leaders...
 - Lead by example
 - Engage and empower team member
 - Actively listen and Practice 3-way communication
 - Develop team members by teaching, coaching, and knowing how to give constructive feedback
 - Recognize team members
- Leaders improve **SAFETY CLIMATE AND SAFETY OUTCOMES**

SHORT QUIZ

Read each statement and choose the safety leadership skill that best fits each situation. Enter the letter in the blank. Use each skill only once.

- A) Leading by Example
- B) Engaging and Empowering Team Members
- C) Actively Listening and Practicing 3-Way Communication
- D) DEveloping Team Members Through Teaching, Coaching, and Feedback
- E) Recognizing Team Members for a Job Well Done

1. After explaining how to address a safety hazard, a superintendent asks his foreman to repeat the steps back to him to make sure he understands his instructions. This is an example of: _____.
2. Being safe in everything you do on the job site, also called 'Walking the Talk', is an example of: _____.
3. If an apprentice identifies a job hazard and helps to come up with a solution, her foreman should use _____ to reward her.
4. An experienced worker respectfully tells a team member why what he is doing is unsafe and explains how he could do it more safely. This is an example of: _____.
5. At a daily safety huddle, a foreman asks for input from her team on what hazards they may face during the day, and how they plan to avoid them. This is an example of: _____.



MODULE 1

Introduction to FastTrack Schedule

Essentials of FastTrack Schedule

Module 1: Introducing FastTrack Schedule

This module introduces you to FastTrack Schedule and explains the fundamental concepts behind the application. You will learn the three views of the application and what you should do to get started.

- a. Application Overview
- b. Three Views
- c. Schedule View
- d. Datelines
- e. Two Windows Interfaces
- f. Action Columns

Module 2: Top Down Planning

This module details how to develop a structured planning stage for your project.

- a. Project Information
- b. Introduction to Work Calendars
- c. Entering Data - Outline
- d. Entering Bars - Durations

Module 3: Linking Dependencies

In this module, you will learn about constraint dates, constraint types, and how to create dependencies between tasks through linking.

- a. Creating Dependencies
- b. Constraint Columns
- c. Link Tab within Information Form
- d. Link Types

Module 4: Customizing Columns

In this module, you will learn how to detail your schedule by customizing FastTrack Schedule's many available columns.

- a. Text Columns
- b. Number Columns
- c. Column Summaries and Summary Bar Values
- d. Hyperlink Columns
- e. Image Columns
- f. Column Descriptions

Module 5: Reporting (Layouts & Filters)

This module will teach you features that will aid you in reporting data from your schedule. You will learn how to easily access groups of columns with the use of layouts. You will also learn how to search for and show specific rows of data in your schedule based on criteria you set.

- a. Understanding Layouts
- b. Creating Customized Layouts
- c. Understanding Filters
- d. Creating Column/Value Criteria Filters
- e. Creating Date/Time Criteria Filters
- f. Multi-criteria Filters
- g. Resource View Filters

Module 6: Baselines & Progress Tracking

After completing this module you will know how to track the progress of your schedule using baseline, revised date, and actual date columns. You will also learn how to interpret the % Used and Status columns.

- a. Understanding Baselines
- b. Progress Tracking
- c. Tracking with Dependencies
- d. Revised Dates
- e. Percent Complete and Actual Dates
- f. % Used and Status Columns

Module 7: Styles (Outlines, Rows, Bars)

This module will show you how to define and apply formatting styles, which will help enhance the presentation quality of your schedules.

- a. Outline Level Styles
- b. Modifying Bar Styles
- c. New Bar Styles
- d. Dynamic Labels
- e. Timeline Graph

Module 8: Printing & Visual Enhancing

In this module, you will learn how to visually enhance your schedule, print out your schedule, and export your schedules in other formats.

- a. Timeline Range Toolbar
- b. Print Preview
- c. Page Options
- d. Print Setup
- e. Headers and Footers
- f. Inserting Legends, Text Boxes, and Pictures
- g. Exporting as Picture, iCal and .ics, 3rd party applications
- h. Additional Save Options
- i. Formatting Calendar View

Advanced Features of FastTrack Schedule

Module 9: Advanced Features Introduction

This module reviews the Essentials of FastTrack Schedule and introduces advanced ways of beginning a new schedule.

- a. Recap of FastTrack Schedule
- b. Schedule View Information Form

Module 10: Resources

This module will teach you how to create, assign, and manage resources using the Resource and Schedule Views.

- a. Understanding the Resource View
- b. Creating Resources
- c. Resource Information Form
- d. Effort Driven and Fixed Duration
- e. Assigning Resources
- f. Managing Resources
- g. Resource Allocation
- h. Resource Work Usage Graph
- i. Resource View Filters
- j. Tracking Resource Costs

Module 11: Work Calendars

This module will teach you how to create the different types of work calendars and their use.

- a. Defining Calendars
- b. Using Calendars

Module 12: Calculations

This module will teach you how to create and use customizable calculation columns.

- a. Calculation Columns
- b. Calculation Elements
- c. Defining a Calculation

Module 13: Summary Graphs

Summary graphs summarize the values currently displayed in columns over a particular period of time. In this module, you will learn how to create and edit summary graphs and set them to display in particular layouts.

- a. Understanding and Inserting Summary Graphs
- b. Formatting Summary Graphs
- c. Summary Graphs in Layouts

Module 14: FastSteps

FastSteps are macros with saved repetitive steps. In this module, you will learn how to create FastSteps and save time when building client reports, setting up status meeting printouts, and auto-exporting updated graphics.

- a. Review of Ranges, Layouts & Filters
- b. FastSteps Overview
- c. Creating FastSteps
- d. Working with FastSteps

Module 15: Templates

This module will teach you how to save your schedule as a template to quickly create future, similar schedules.

- a. Using Templates
- b. Template Options

Module 16: Consolidating Schedules

In this module, you will learn how to easily consolidate your FastTrack Schedule files into one master file to analyze a big picture view of all your data.

- a. What is Consolidation?
- b. How to Consolidate
- c. Schedule View
- d. Resource View



Module 1

Introducing FastTrack Schedule

Overview: This module introduces you to FastTrack Schedule and explains the fundamental concepts behind the application. You will learn about the three views of the application and what you should do to get started.

- a. Application Overview
- b. Three Views
- c. Schedule View
- d. Datelines
- e. Two Windows Interfaces
- f. Action Columns



Application Overview

FastTrack Schedule is a project management application for tracking all your projects, activities, tasks, resources, to-do lists, and deadlines.

FastTrack Schedule helps you organize, track, and manage your projects by graphically representing start and finish dates as bars along a timeline graph. Within project management, this type of schedule is known as a Gantt chart, named after its creator, Henry Gantt.

FastTrack Schedule automates the Gantt chart, making it a dynamic timeline. In addition to extensive graphic capabilities and customizable features, it is also a powerful database. As you draw, resize, and move bars along the timeline graph, it automatically updates start and finish dates, durations, dependencies, percent complete values, and costs.

To enter an activity you can draw a bar directly on the timeline graph and have FastTrack Schedule enter the duration and dates for you, or you can enter the duration or the dates in columns and have FastTrack Schedule draw the bar for you.

In fact, everything you can do to an activity bar can be done with your mouse and the tools in FastTrack Schedule's Toolbars, or by editing values in columns. This flexibility allows you to concentrate on the activities you are scheduling, instead of the act of scheduling those activities.

Notes:

Throughout this training guide you will see a notes box just like this one.

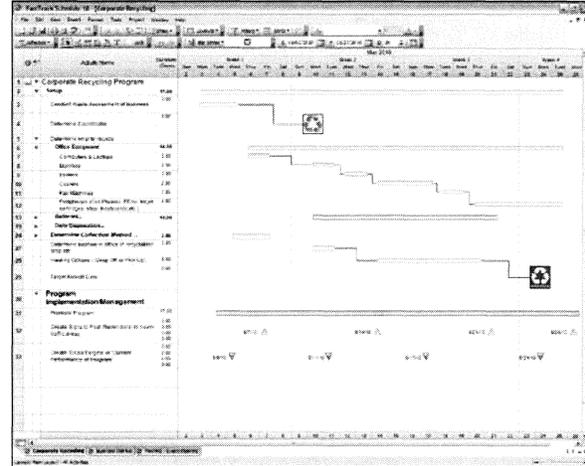


Three Views

FastTrack Schedule has three views. Each view is designed to complement different aspects of your overall project.

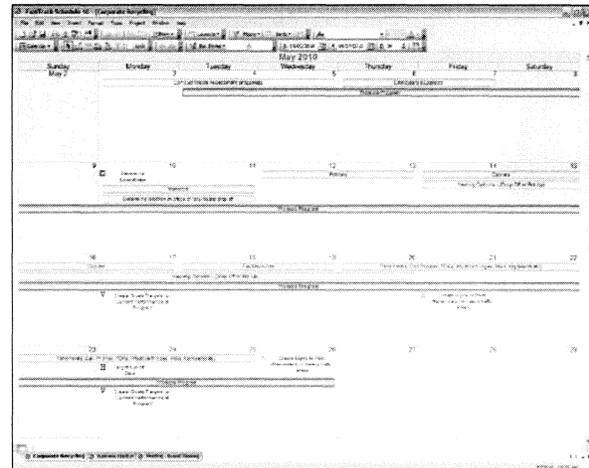
Schedule View

This is the primary View of FastTrack Schedule; all other Views support the Schedule View. It is in this View that you enter activities; draw activity bars along a timeline; link bars; view critical paths; track the Scheduled, Revised, and Actual dates and times of tasks in your schedule; insert pictures, text boxes, and legends; and create and view summary graphs.



Calendar View

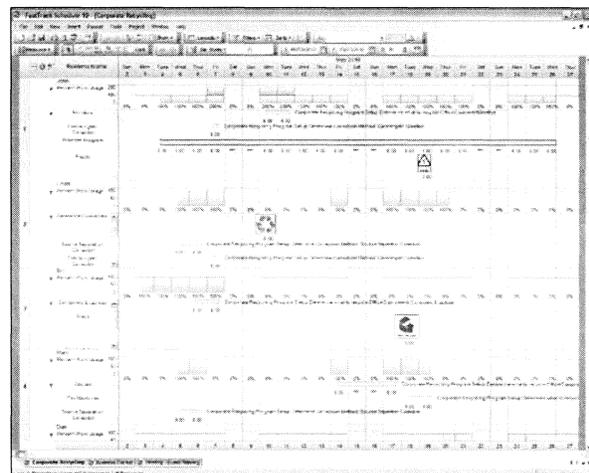
The Calendar View displays information from the Schedule View in the traditional look of a wall calendar. This allows you to view time vertically rather than horizontally, as you do in the Schedule and Resource Views. You can view and print completely customizable calendars that can be filtered to display only those activities you want to see. You can also create a calendar of any number of contiguous weeks.



Resource View

In this View you track and manage the use of resources in your project. You can see exactly to what tasks your resources are assigned, what percentage of their total available time is being used, and how many hours they are working in a given unit of time.

In this View, you can create resources, move bars in the timeline, and change the Scheduled, Revised and Actual dates of tasks.





Schedule View

This is the primary View of FastTrack Schedule and should be understood first. Breaking this view into its different components makes it easier to understand.

Columns

FastTrack Schedule stores columns in three distinct ways. Columns for the Schedule View are stored either per row or per bar. Since multiple bars per row is supported, data in the rows either belong to the row or belong to the bar. Columns for the Resource View are stored per resource row.

Every column in the Schedule View and Resource View is application-defined. Columns are hidden until you choose to insert them into a layout. No column can truly be deleted and the Column Map can help you keep track of which of the hundreds of available columns you have inserted and, possibly, renamed.

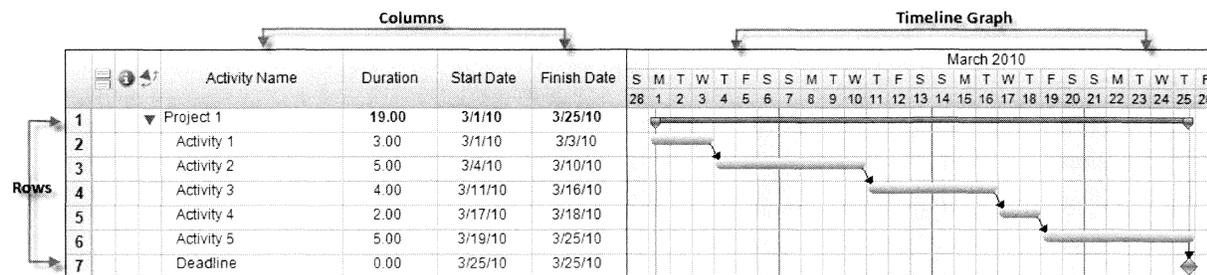
You change the look of your schedule by showing, hiding, and arranging columns. Groups of selected columns are called Layouts.

Rows

Rows, which are found in the Schedule View, contain all of the information pertaining to a particular activity. Summary Rows are rows that have sub rows. To view summary bars in summary rows, select Summary Bars from the View Menu.

Timeline Graph

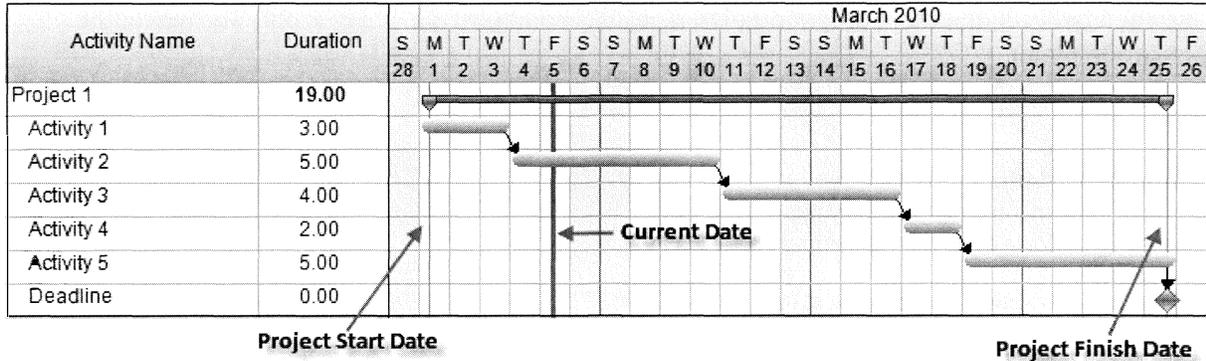
In the Schedule View, the timeline graph is the grid of horizontal and vertical lines on which activity bars sit. In the Resource View, the timeline is the grid of horizontal and vertical lines on which assigned activity bars and resource graphs sit. The timeline can represent any range of time you determine, in units of hours, days, weeks, months, quarters, and years.





Datelines

A dateline is a way to graphically highlight, in the timeline, a date and time key to your schedule. You can choose to hide or show datelines in the timeline, and you can format each dateline's appearance.



To format a Dateline:

1. Go to the Format menu > Datelines.
2. Under Dateline Display, select from the options described below.
3. Click OK to apply your changes and close the dialog

This Option:	Does This:
Dateline	Allows you to display the following: - Dateline - Project Start Dateline - Project Finish Dateline - Up to 10 custom datelines
Show Dateline	When selected, displays the selected dateline in the Schedule View.
Color and Size	Allows you to format the appearance of the selected dateline.
Auto Update Every	Allows you to determine how often the <i>Dateline</i> should update.
Set Date/Time To	Allows you to enter a static date and time that does not change unless you choose another date.

Notes:

The Dateline can move in real time by Auto Updating per the options you set. Custom datelines and the Dateline can also be set to appear in the timeline on the static date and time which you set. The locations of the Project Start and Finish datelines are determined by the activity data in your schedule.



Two Windows Interfaces

The Ribbon Bar

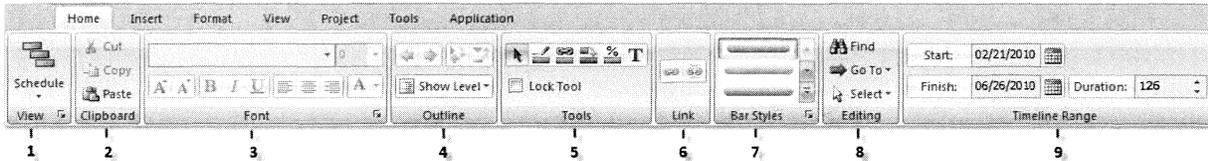
The ribbon interface replaces menus with tabs. From each tab you can access grouped controls that allow you to perform all the program functions. In FastTrack Schedule the View group, from which you can switch between the three program views, is available on every tab. There is only one menu, the **Application menu**.

1. **Application Button** – displays the application menu which lists controls used to perform actions on the entire document.
2. **New** – opens the Getting Started dialog.
3. **Open** – open an existing FastTrack Schedule file.
4. **Import** – import data, iCalendar files and MindJet MindManager files.
5. **Save** – saves the file to its existing location.
6. **Save As** – save the active file with a new name or to a new location or as a template.
7. **Print** – print the open view, open the Print Preview window, set print and page options.
8. **Prepare** – open the properties dialog and set password restrictions for the active file.
9. **Send To** – sends the active file as an attachment or as a picture in an email.
10. **Publish** – publish a file to an iCalendar server, unpublish an iCalendar file, view the publish log.
11. **Export** – export the active file as data, HTML, an mpx file, a Microsoft Project XML file, an iCalendar file, a MindJet MindManager file or a picture.
12. **Close** – close the active file or close the Print Preview window.
13. **Application Options** – set options for FastTrack Schedule.
14. **Document Options** – set options for the active file.
15. **Exit FastTrack Schedule** – closes the program and all active FastTrack Schedule files.
16. **Recent Documents** – view a list of all recently opened files.
17. **Quick Access Toolbar** – always visible, click the icons in this toolbar to quickly save, undo, redo, open existing schedules, open new schedules, and open the Print Preview window.



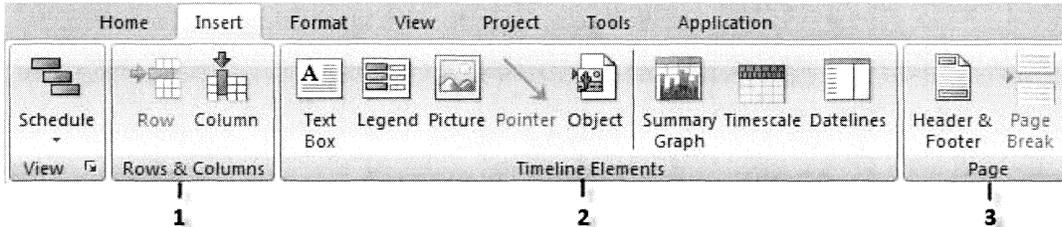


Home tab



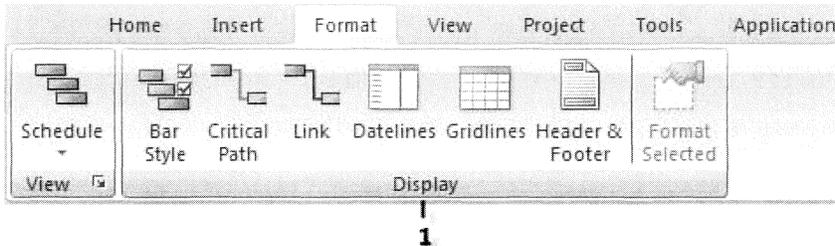
1. **Views Group** – switch between the Schedule, Calendar and Resource Views. This group is available on every tab of the Ribbon interface.
2. **Clipboard Group** – cut, copy and paste selected items.
3. **Font Group** – edit font name, size, color, appearance and alignment of text.
4. **Outline** – indent, outdent, show, hide and view activity outline levels.
5. **Tools Group** – arrow (select), draw bar, draw link, revise, % complete, text tools.
6. **Link Group** – create and remove dependencies.
7. **Bar Styles Group** – select and edit bar styles.
8. **Editing Group** – find and replace text, go to Today’s date or a specific bar or row, hide, show or select all.
9. **Timeline Range Group** - determine the visible range of time in the timeline graph

Insert tab



1. **Rows & Columns Group** – insert new rows or columns into your schedule.
2. **Timeline Elements Group** – insert text boxes, legends, pictures, pointers and objects into your schedule. Add, edit or remove Summary Graphs, Timescale rows and Datelines.
3. **Page Group** – insert Headers and Footers to the printed document and page breaks to the selected row.

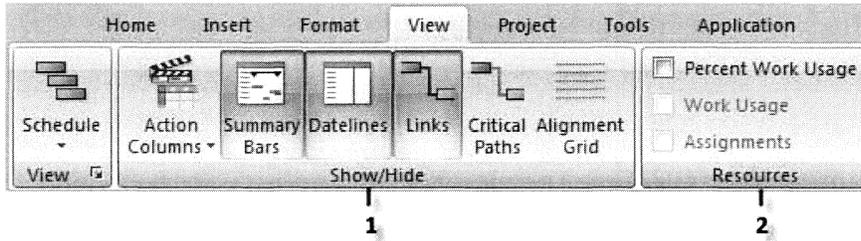
Format tab



1. **Display Group** – open the format dialog to determine the display of: bar styles, critical path, links, datelines, headers, footers and selected items.

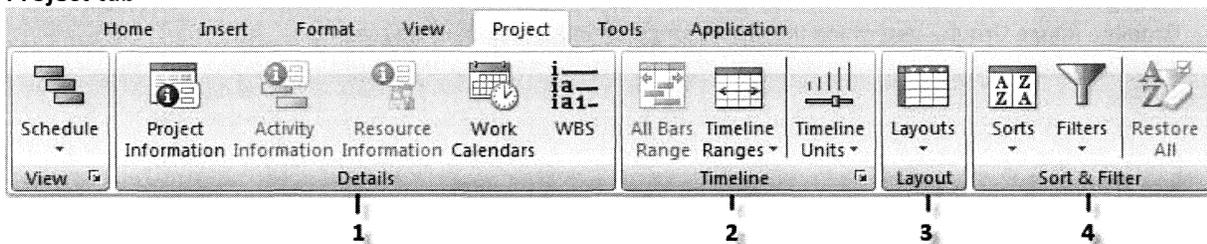


View tab



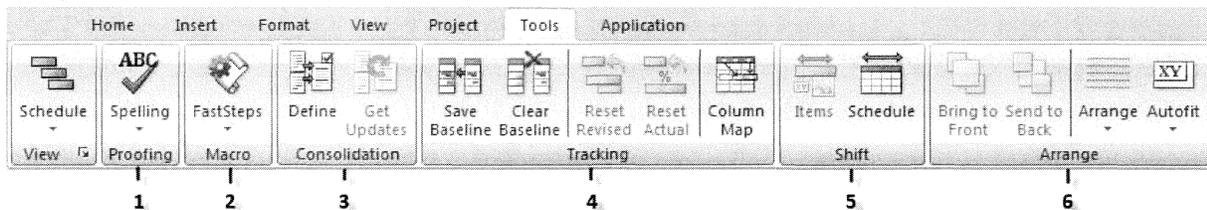
1. **Show/Hide Group** – show or hide action columns, datelines, links, critical paths and the alignment grid.
2. **Resources Group** – show or hide the Percent Work Usage, Work Usage and Assignments summary rows for resources. Percent Work Usage is the only resource summary row that can display in the Schedule View. No summary graphs can display in the Calendar View.

Project tab



1. **Details Group** – open information forms to edit data regarding: the Project as a whole, activities and resources. Open the Work Calendar for the project and establish a WBS (work breakdown structure) to establish a hierarchy of tasks.
2. **Timeline Group** – quickly set the timeline range to show all bars in the schedule. Define, edit and select ranges of time to view in the timeline. Change the units in which you view time in the schedule.
3. **Layout Group** – define, edit and select schedule layouts.
4. **Sort & Filter Group** - define, edit and select sorts and filters to view a specific subset of data in your schedule. Restore the order of sorted data and unhide any data hidden by a filter.

Tools tab



1. **Proofing Group** – correct spelling in the entire open View or specified parts of the schedule. Set the spelling options.
2. **Macro Group** – create, edit and run FastSteps scripts.
3. **Consolidation Group** – determine the files to consolidate and define the parameters of the consolidation. Update data in files you've consolidated.
4. **Tracking Group** – define and edit baseline, revised and actual activity dates and times. See how your custom column names map to their original program-defined names.
5. **Shift Group** – shift items or the whole schedule backwards or forwards in time.
6. **Arrange Group** - arrange overlapping items, set snap to grid, and column row and selecting auto fit options.



Application tab



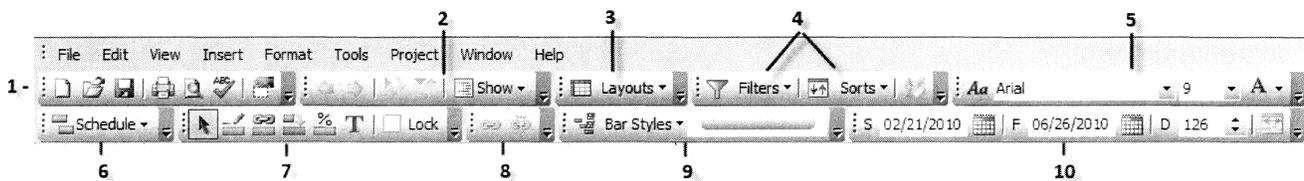
1. **Product Group** – access helpful websites and open the program’s About dialog.
2. **Help Group** – get help using the program with tutorials, example files and keyboard shortcuts.
3. **Workspace Group** – manage the look and feel of your workspace, and switch your theme from Ribbon to Classic Menu.
4. **Window Group** - determine how multiple open FastTrack Schedule windows will display.

The Classic Menu Bar

For users who like the classic menu and toolbar look, you can easily switch to it.

In the Ribbon, go to the Application tab > Themes > Classic Menu Bar. You must relaunch the application for changes to be applied.

To switch from Classic to Ribbon, go to View menu > Themes > Ribbon Bar. You must relaunch the application for changes to be applied.



1. **Standard Toolbar** – open new and existing FastTrack Schedule files, save print, open Print Preview, check spelling and format the selected item.
2. **Outline Toolbar** – indent, outdent, show, hide and view activity outline levels.
3. **Layouts Toolbar** – define, edit and select schedule layouts.
4. **Filter and Sorts Toolbar** – define, edit and select sorts and filters to view a specific subset of data in your schedule. Restore the order of sorted data and unhide any data hidden by a filter.
5. **Fonts Toolbar** – edit font name, size, color, appearance and alignment of text.
6. **Views Toolbar** – switch between the Schedule, Calendar and Resource Views.
7. **Tools Toolbar** – arrow (select), draw bar, draw link, revise, % complete, text tools.
8. **Link Toolbar** – create and remove dependencies.
9. **Bar Styles Toolbar** – select and edit bar styles.
10. **Timeline Range Toolbar** – quickly set the timeline range to show all bars in the schedule. Define, edit and select ranges of time to view in the timeline. Change the units in which you view time in the schedule.



Action Columns

FastTrack Schedule's Action Columns simplify working with activities and resources. The Action Columns can be displayed to the left of the columns in the Schedule. They simplify operations performed on rows and outline levels.

	  	Activity Name
1		▼ Project 1
2		Activity 1
3		Activity 2

Row Number/Select Row

Clicking here selects the row for moving, deleting, copying, cutting, formatting, and hiding.

Page Break

Clicking here makes the corresponding row the last row on a printed page. It forces the next row to print on a new page.

Information Form

Clicking here opens the Information form in the Schedule View and the Resource Information form in the Resource View. The Information forms display data about the activities and resources in the row.

 This calendar icon will appear within the Information Form action column of an activity which has a Task Calendar applied, different from the standard project calendar. More information on Task Calendars can be found in Module 11: Work Calendars.

 This icon will appear within the Information Form action column of an activity which has data entered in the Notes column.

	  	Activity Name
1	 	Activity 1

Expand/Collapse

Clicking here collapses and expands outline levels in the Schedule View and subrows in the Resource View.



MODULE 2

Top Down Planning



Module 2

Top Down Planning

Overview: This module details how to develop a structured planning stage for your project.

- a. Project Information Form
- b. Introduction to Work Calendars
- c. Entering Data - Outline
- d. Creating Bars - Durations



Project Information Form

The Project Information form allows you to define the project's start date and time and view the finish date and time. The Project Finish Date is defined by the latest activity bar's finish date and time.

The "project" is a subset of the data in your schedule determined by your definition of the Start Date. Thus, there can be data scheduled before the Project Start Date.

To define the Project Start Date:

1. Go to the Project menu > Project Information.
2. Select which Calendar the project should use as default.
3. Use the controls to set the Project Start Date and Time.
4. Click OK to close the dialog.
5. The Project Start Date dateline will now display as a vertical line in the timeline on the date and time you have specified.

The screenshot shows the 'Project Information' dialog box. It has a title bar with a question mark and a close button. The dialog is divided into three sections: 'Calendar', 'Start Information', and 'Finish Information'. The 'Calendar' section has a dropdown menu set to 'Standard (Project Calendar)'. The 'Start Information' section has 'Project Start Date' set to '03/01/2010' and 'Project Start Time' set to '8:00 AM'. The 'Finish Information' section has 'Project Finish Date' set to '03/25/2010' and 'Project Finish Time' set to '5:00 PM'. At the bottom, there is a help icon, an 'OK' button, and a 'Cancel' button.

Project Calendar

Select the work calendar that best fits the available days and time for scheduling activities for the project.

Standard (Project Calendar)

The default Project Calendar. This Standard calendar is defined as a typical Monday – Friday, 40-hour work week. This can be modified to fit company's own typical work week.

24 Hours

Used when tasks in a project can occur 24 hours in a day.

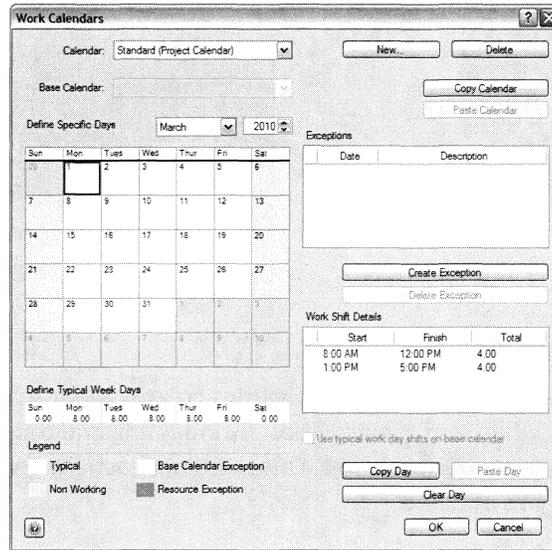
Night Shift

Activities are mostly conducted at night. The Night Shift calendar is defined as a late evening – morning shift. This can be modified to fit company's own night shift.



Work Calendars

Work Calendars allow you to define the available time for activities to be scheduled. You may define work hours for typical and non-typical work days, as well as non-work periods for your schedule. Non-work periods are times when activities cannot be scheduled, for example, holidays, weekends, and after hours.



To modify predefined work calendars:

1. Go to the Project menu > Work Calendars

Element:	Does This:
Calendar	Selected calendar's name. "Project Calendar" will appear if it is the applied calendar in Project Information.
Base Calendar	If applicable, the selected calendar's base calendar appears here. Typically, a resource's calendar will have a base calendar of the company calendar or a country's calendar. When changes are made to a calendar which is being used as a base calendar, the changes will also be applied to the calendars using it as a base calendar.
Typical Week Day	Allows you to set up a work schedule in which each day of the week might have different hours, for instance, a Friday might differ from other days.
Specific Day	Allows you to define specific days of the year that deviate from the typical days. A specific day can have its own set of hours.
Work Shift Details	Defines the Start and Finish Times for a typical or specific day.
Create Exception	Allows you to define a specific day's work hours or account for holidays or events that occur over weekends. You may also provide a brief description for the exception.

Once a Work Calendar is defined, it is used to drive when activities are scheduled. A Work Calendar can be applied as the calendar for the project, an activity, a resource or a link.

Each schedule has its own Work Calendars. You can, however, copy and paste a Work Calendar from one file to another file if you would like to use an existing work calendar's arrangement.



Entering Data

Data can be entered simply by clicking in any column and then typing. Using a top down design for data entry will help you be more organized. Top Down design refers to a method or procedure that starts at the highest level of abstraction and proceeds toward the lowest level. The higher levels are usually names of phases and the lower activities are the details that make up each phase.

				Activity Name
1			▼	Planning
2				Brainstorm
3				Research
4				Budget

Outlining activities

In the Schedule View, outlining activities creates a hierarchy of activity levels; for instance, projects, phases, activities, and sub activities. By indenting and outdenting activity names, you can create as many outline levels as you would like. Once outlined, activity levels can be collapsed and expanded to show different levels of detail.

To indent an activity underneath another activity:

1. Click on the Activity Name cell of the row you wish to indent. The cursor must be to the left of the text (not at the end).
2. In the Outline Toolbar, click the Indent button. 
-or-
Press the Tab key on your keyboard.

To outdent an activity by moving it to the level above:

1. Click on the Activity Name cell of the row you wish to outdent. The cursor must be to the left of the text (not at the end).
2. In the Outline Toolbar, click the Outdent button. 
-or-
Press the Backspace key on your keyboard.



Entering Bars

Using Duration column to draw activity bars and milestones

Entering values in the duration column creates an activity bar in the timeline graph. The start of the bar will draw on the Project Start Date, which is defined in the Project Information dialog. You can also type in the Start Date and a Finish Date columns; however, using the duration column is recommended if you plan to create dependencies between tasks.

To draw an activity bar by typing:

1. Make sure the Duration column is displayed. If not, go to Insert menu > Column > locate Duration
2. If entering a new bar, select a bar style from the Bar Styles Toolbar.
3. Click in the Duration column intersecting the Activity.
4. Enter or edit the duration value.
5. Press the ENTER key to move to the next row.

To draw a milestone by typing:

1. Select a milestone style from the Bar Styles Toolbar.
2. Click in the Duration column intersecting the Activity.
3. Enter a value of 0.
4. Press the ENTER key to move to the next row.

	Activity Name	Duration	Start Date	Finish Date	S	M	T	W	T	F	S	S	M	T
					28	1	2	3	4	5	6	7	8	9
▼	Project 1	6.00	3/1/10	3/8/10										
▼	Phase A	6.00	3/1/10	3/8/10										
	Activity 1	6.00	3/1/10	3/8/10										
	Activity 2	5.00	3/1/10	3/5/10										
	Activity 3	4.00	3/1/10	3/4/10										
	Activity 4	2.00	3/1/10	3/2/10										
	Activity 5	5.00	3/1/10	3/5/10										
	Phase A complete	0.00	3/1/10	3/1/10										

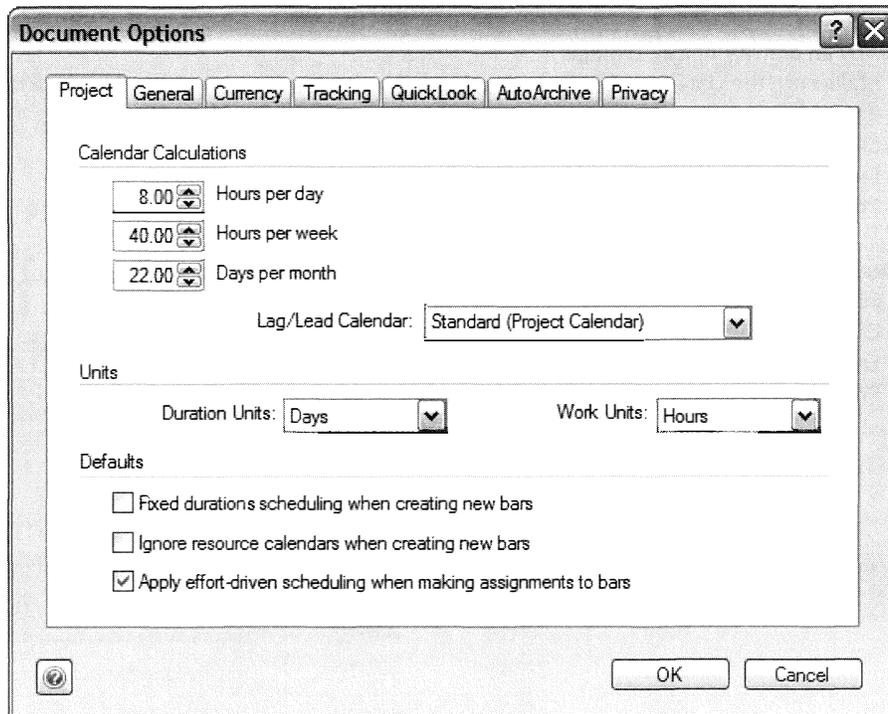
Notes:

The Duration is entered as the number of units you estimate the activity to last. For instance, if the schedule is displaying durations in units of Days, entering "4" in the Duration column draws a bar beginning on the project start date and ending four work days later.



Changing the schedule duration units

FastTrack Schedule allows you to view duration in different units of time. This allows you to view the length of an activity bar in calendar or work hours, days, weeks, months, quarters, or years. For instance, if the schedule shows durations in units of Weeks and you want to see durations in units of Days instead, you can go to Tools menu > Document Options to change the duration units. Your changes affect values in all Duration columns: (Scheduled) Duration, Revised Duration, and Actual Duration.



Calendar units are based on a 24 hours a day 7 days a week model, which allows you to schedule tasks anywhere within those parameters. An activity lasting one calendar day has a duration of 24 hours, 12 AM to 12 Midnight. An activity lasting one work day has an 8 hour duration, 8 AM to 5 PM (with a one hour break), or the length of time you have defined for a work day in the Work Calendar.

To view durations in a different unit of time:

1. Go to Tools > Document Options.
2. Project tab.
3. From the Duration Units value list, select the desired unit of time.
4. Durations will be calculated in the unit chosen from the value list.

Calendar Calculations

When entering data as one duration unit and then switching to display the values as another unit, these calculations will be used.

Lag/Lead Calendar

Define default calendar for links to calculate lag/lead time.



MODULE 3
Linking Dependencies



Module 3

Linking Dependencies

Overview: In this module you will learn about the constraint types, constraint dates and how to create dependencies between tasks through linking.

- a. Creating Dependencies
- b. Constraint Columns
- c. Link Tab within Information Form
- d. Link Types



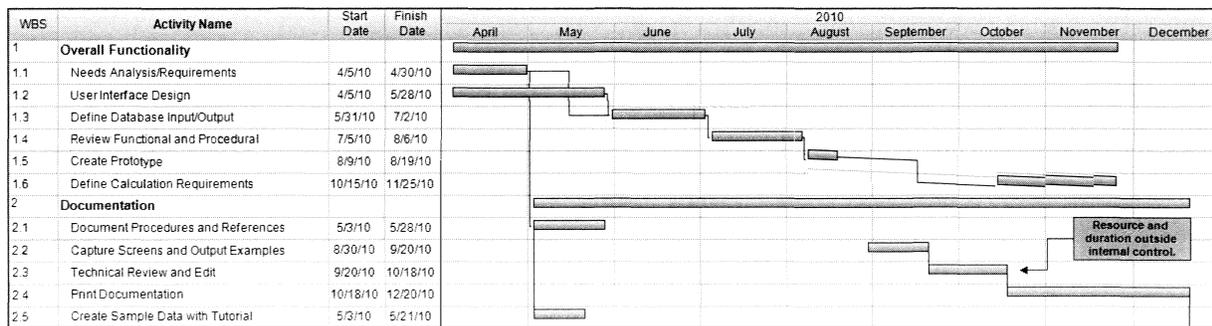
Creating Dependencies

Linking is a means of controlling how changes to the dates and times of one activity impact the scheduling of other activities in your schedule. To link is to create dependencies between activities in your schedule.

For example, if you were scheduling a construction project and a key activity, such as framing, were to slip, then all the projects that can only occur when framing is done, such as drywall, plastering and painting, will all need to be rescheduled accordingly. By linking all these activities in your schedule, you save yourself from having to manually change each affected activity.

Linking in FastTrack Schedule is based on the CPM (Critical Path Method) project management model and follows the standards therein.

Use constraints and lag/lead time to control how activity bars and milestones react to changes in the originally scheduled dates and times.



When setting up task dependencies, consider that there may be scenarios where certain tasks are unable to start until their predecessor tasks have completed. In other cases, a task may need to start before its predecessor task is completed. In these descriptions, a task will need to consider its Lag or Lead (Lag/Lead) duration:

Lag

A unit of duration used as a delay between two tasks. Lag durations are entered as positive values. An example of this could be the predecessor task of *pouring concrete* prior to the successor task of *building a house*. If the concrete takes 2 days to cure and dry, the dependency link would require a **lag** of 2 days.

Lead

A unit of duration used to provide an overlap, or “head-start”, between two linked tasks. Lead durations are entered as negative values. An example of this could be the predecessor task of *completing the shooting of a film*, with a finish to start dependency on a successor task of *editing film*. If *editing film* can begin 7 days prior to the end of *completing the shooting of a film*, then the dependency link would require a **lead** of -7 days.



Constraint Columns

Constraints are the parameters you can assign to activities to control the behavior of bars as your project changes. Constraints in FastTrack Schedule are based on the CPM (Critical Path Method) project management model and follow the CPM standards.

A constraint categorized as *Soft* will allow activities in your schedule to begin and end within an elastic window of time, until the activity's start or finish comes into conflict with another dependency.

A constraint categorized as *Moderate* will not allow activities in your schedule to begin or end before or after the date or time you have specified as a Constraint Date and Time.

A constraint categorized as *Hard* will not allow activities in your schedule to begin or end on any date or time except those which you specified. A hard constraint effectively locks your bar's finish or start and, if the bar is linked, bypasses the defined dependency if that dependency conflicts with its specified start or finish.

Constraint name:	Category:	Behavior:
As Soon As Possible	Soft	The activity is scheduled to begin at the earliest possible moment, taking into account other scheduled activities. There is no specified Constraint Date, however the Project Start Date often acts as the Constraint Date. This is the default constraint type when bars are created by entering the Duration.
As Late As Possible	Soft	The activity is scheduled to begin at the latest possible moment, taking into account other scheduled activities. There is no specified Constraint Date.
Start On Or After	Moderate	The activity is scheduled to begin no earlier than on the Constraint Date you specify. If necessary, it may begin later. This is the default constraint for new activities that are created by drawing bars using the Draw Bar tool.
Start On Or Before	Moderate	The activity is scheduled to begin no later than on the Constraint Date you specify. If necessary, it may begin earlier.
Finish On Or After	Moderate	The activity is scheduled to end no earlier than on the Constraint Date you specify. If necessary, it may end later.
Finish On Or Before	Moderate	The activity is scheduled to end no later than on the Constraint Date you specify. If necessary, it may end earlier.
Must Start On	Hard	The activity will only begin on the specified Constraint Date.
Must Finish On	Hard	The activity will only end on the specified Constraint Date.



Setting bar constraints

Constraints are the parameters you can assign to activities to control how much or how little slippage you will allow in their Start Dates and Times.

To set constraints on an activity:

1. Double-click on the activity bar or milestone.
The Information form opens to the Bars > Tracking tab.
2. From the Constraint Type value list, select the desired constraint type.
-or-
 1. Insert the Constraint Type, Constraint Date and, if needed Constraint Time columns into your schedule.
 2. Enter the appropriate data into the Constraint Date and/or Constraint Time column.
 3. Click in the Constraint Type column and use the value list to select the desired constraint type.

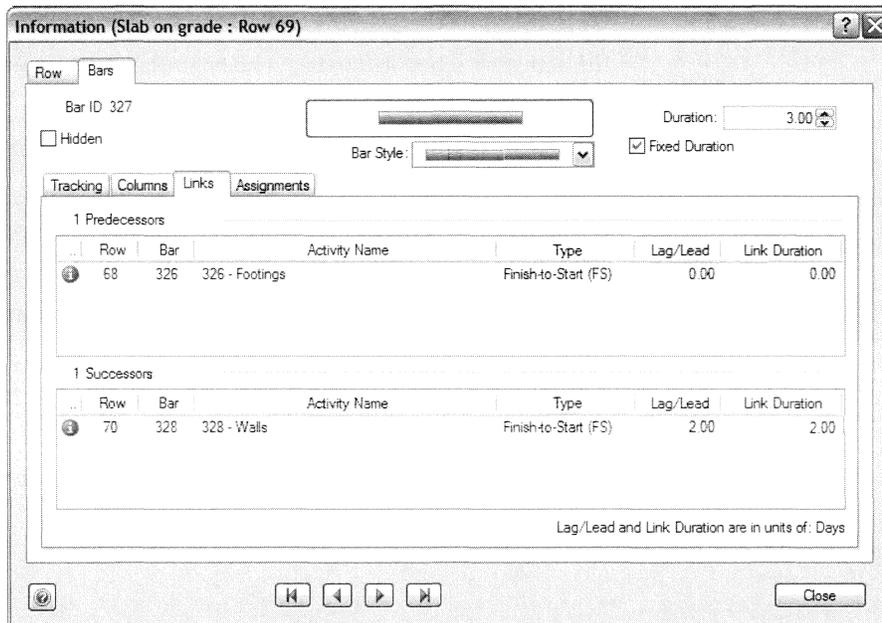
Link Tab within Information Form

The Bars > Links tab of the Information form allows you to set and modify important link information. You can create links by opening the Information form for a particular bar and then entering information about the predecessor and successor bars to which you want to link that bar.

Predecessor Bar –the predecessor bar is the "From" and the bar whose information you are currently viewing in the Information form is the "To." So if a link in the Predecessors table is classified as Type "Finish to Start," the link originates from the Finish point of the predecessor bar.

Successor Bar – the successor bar is the "To" and the bar whose information you are viewing in the Information form is the "From." So if a link in the Successors table is classified as Finish to Start, the link extends to the Start point of the successor bar.

The labels predecessor and successor have nothing to do with a bar's location in the timeline or its dates. The terms relate only to the From/To direction that defines a link's Type.



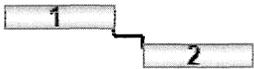
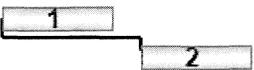
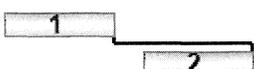
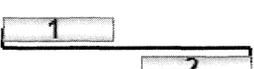


Below is an explanation of each column in the Predecessors and Successors tables located in the Bars > Links tab of the Information form. You can edit directly into this form to create dependencies, define link type, lag/lead, etc.

In this column:	Do this:
	Click the icon to open the Information form for the activity bar.
Row	Enter or edit the row number of the predecessor or successor bar.
Bar	Enter or edit the Bar ID of a bar you want to be linked from (predecessor) or linked to (successor).
Activity Name	View the activity name of the predecessor or successor bar. When you have entered a Bar ID and/or Row number, the name of the activity is filled in. Once it appears in the cell, you can edit the activity name of a predecessor or successor bar.
Type	Select the origin and destination of the link. FastTrack Schedule supports Finish-to-Start, Finish-to-Finish, Start-to-Start, and Start-to-Finish links.
Lag/Lead	Enter or edit the lag/lead time for this link. This is the required minimum number of duration units between the two activities, relative to the Link Type. See Page 3:2 for definition.
Link Duration	This is the number of duration units of the link.

Link Types

FastTrack Schedule supports four types of links – Finish-to-Start, Start-to-Start, Finish-to-Finish, and Start-to-Finish links.

This link type:	Looks like this:	And works this way:
Finish-to-Start		Activity 1 must finish before Activity 2 starts. This is the most commonly used link type.
Start-to-Start		Activity 2 must not start until Activity 1 starts.
Finish-to-Finish		Activity 2 must not finish until Activity 1 finishes.
Start-to-Finish		Activity 2 must not finish until Activity 1 starts.

Linking activity bars

Bars can only be linked in the Schedule View. Linking activity bars creates a dependency from a point on one bar (the "predecessor") to a point on a second bar (the "successor"). This dependency illustrates the relationship that the dates of one task have to another.



For instance, if the start of the task "Interview for Position" cannot begin until the task "Read Resumes" has ended, the two are dependent and should be linked with a Finish-to-Start relationship.

To link bars:

1. From the Toolbox, select the Draw Link tool.
2. Click the finish or start of one bar and drag to the start or finish of a second bar.
-or-
1. Using the Arrow tool, select the two (or more) bars you want to link.
To select multiple bars, you can hold down the Shift key and click on desired bars.
2. From the Edit menu, select Link.
Link is also accessible by context-clicking (right-click) on one of the two selected bars.
-or-
1. Double-click an activity bar.
2. In the Bars > Links tab of the Information form, create a link by entering data in either the Predecessors or Successors table.

Choosing Link from the Edit menu (or Link Bars tool) automatically draws links from the finish point to the start point of the selected bars. Every time this tool is used, it will draw a Finish-to-Start link. You can also define Finish-to-Finish, Start-to-Start, and Start-to-Finish links via the Link Information dialog or Information Form > Bars > Links tab.

To apply a different Link Type, you can double-click on the link drawn on the timeline graph. The Link Information dialog will appear:

Link Information

Row : Bar

From: 69 : 327 Slab on grade

To: 70 : 328 Walls

Type: Finish-to-Start (FS)

Lag/Lead: 2.00

Link Duration: 2.00 (Days)

Lag/Lead Calendar: Follow Document Preference

Delete OK Cancel

Lag/Lead Calendar

Select the work calendar to use to calculate lag/lead duration. You can even specify to calculate based on the predecessor or successor calendar.

Follow Document Preference

This preference is defined in Tools menu > Document Options. The calendar that is selected in Document Options is the default calendar that will be used to calculate lag. You may also apply a different calendar for each link as appropriate.

Critical Path

To view the critical path of your project, go to the View menu > select Critical Path. The links between activities on the critical path should display in red (or a different color selected).



MODULE 4

Customizing Columns



Module 4

Customizing Columns

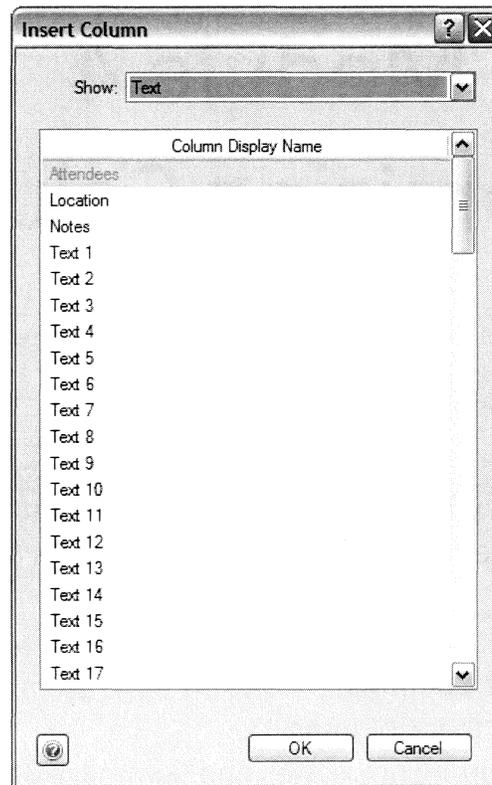
Overview: In this module, you will learn how to detail your schedule by customizing FastTrack Schedule's text, number, hyperlink and image columns.

- a. Text Columns
- b. Number Columns
- c. Column Summaries and Summary Bar Values
- d. Hyperlink Columns
- e. Image Columns
- f. Column Descriptions



Text Columns

Inserting columns that are currently hidden allows you to see different views of your data. Although you may not see all of the columns when you first open the application, all of the columns are available to insert at any time.



To show, or insert, a hidden column:

1. Select the column heading to the left of the intended position.
2. Go to Insert menu > Column.
3. Select the name of the column you wish to show from the Column Display Name table. By holding down the Control key, you can select multiple column names in the table.
4. Click OK to insert the selected column and close the Insert Column dialog. The column now displays in your schedule.

Notes:

The Column Display Name table contains all existing but hidden columns. If the column you want to insert is not listed, it is already shown. You may have changed its name.

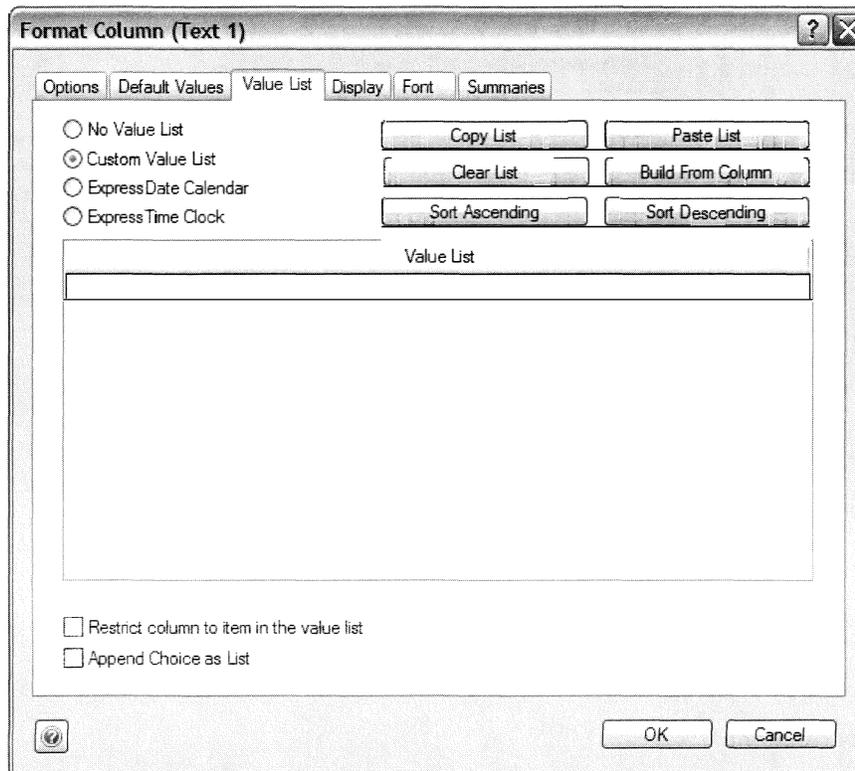


Formatting Text Columns

Changing the display of values in the column allows you to customize the appearance of the data it contains. For instance, you could add a Custom Value List that contains only the values that you want to allow in the column.

To format the Value List in a column:

1. Select the column heading of the column you want to format.
2. Go to the Format menu > Column.
3. Select the Value List tab.
4. Use the available options to format the Value List of the selected column's data.
5. Click OK to apply your changes and close the Format Column dialog.



Restrict column to item in the value list

Selecting this option will prevent users from manually typing in values in the column that do not exist in the defined Value List.

Append Choice as List

Selecting this option will append added values to existing values in the column. If this option is not selected, added values will replace existing values in the column.

Build from Column

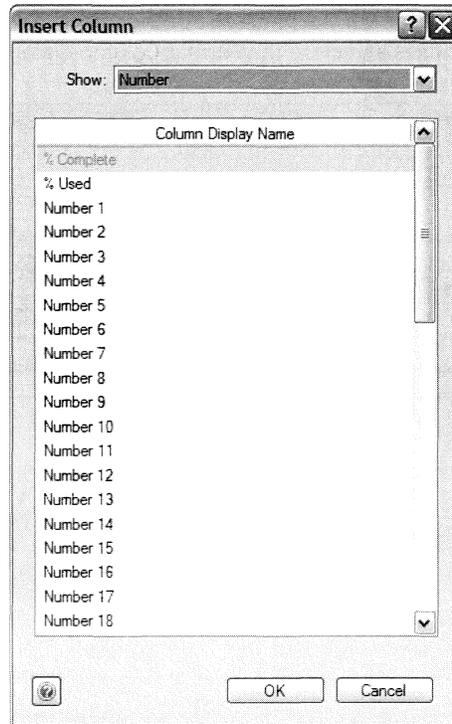
Easily create a value list using existing values in the column by clicking on this button.



Number Columns

To show, or insert, a hidden column:

1. Select the column heading to the left of the intended position.
2. Go to Insert menu > Column.
3. Select the name of the column you wish to show from the Column Display Name table. By holding down the Control key, you can select multiple column names in the table.
4. Click OK to insert the selected column and close the Insert Column dialog. The column now displays in your schedule.



Formatting Number Columns

Changing the display of values in the column allows you to customize the appearance of the data it contains. For instance, you could change the display of a Number column so it displays a dollar sign, comma separator, and two decimal places.

To format the display of data in a column:

1. Double-click on the column heading of the column you want to format
2. Select the Display tab. If display options are available for that column, they will appear.
3. Use the available options to format the display of the selected column's data.
4. Click OK to apply your changes and close the Format Column dialog.

Notes:

Each column is predefined to display certain type of data. You cannot change the type of data displayed in columns.



Column Summaries and Summary Bar Values

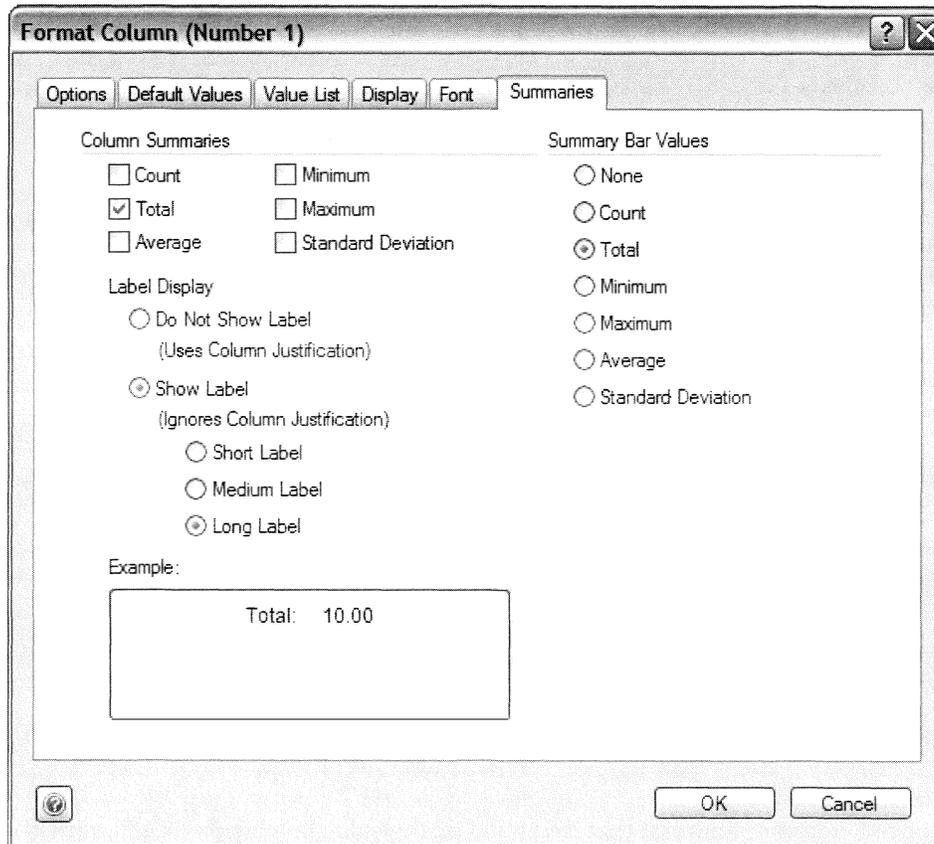
All columns have a Summaries tab. Within this tab, there are two types of summaries: Column Summaries and Summary Bar Values. Both types of summaries allow you to calculate Count, Total, Average, Minimum, Maximum, and Standard Deviation.

Column Summaries are displayed on the schedule at the bottom of the formatted column. They calculate all data displayed in the column.

Summary Bar Values are displayed in every summary row intersecting the formatted column. The value is derived from the subrows or 'children' of the summary row.

To format the Summaries of a column:

1. Double-click on the column heading of the column you want to format.
2. Select the Summaries tab.
3. Use the available options to format the summaries of the selected column's data.
4. Click OK to apply your changes and close the Format Column dialog.



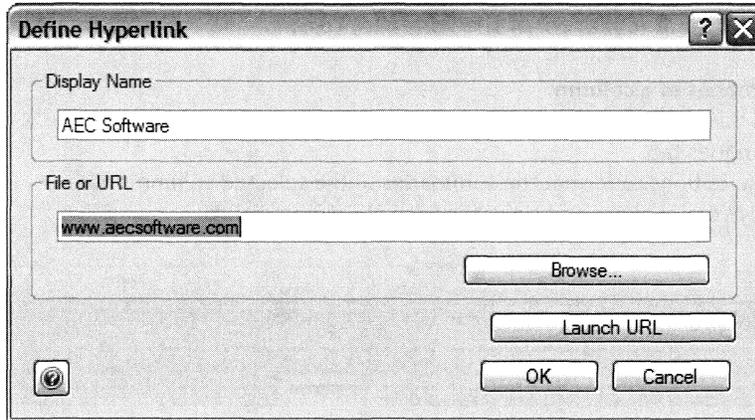


Hyperlink Columns

Hyperlinks allow you to launch a file or URL address from within the Schedule or Resource Views of FastTrack Schedule. Insert a hyperlink column into a Schedule View layout to display hyperlink values.

Entering and editing hyperlinks

Hyperlinks are entered and edited in the Define Hyperlink dialog, accessed through the Information form or the hyperlink column. Hyperlinks display as blue underlined text.



To enter a value in a hyperlink column:

1. Insert menu > Column > select Hyperlink column.
2. Right-click (Context-click) on the empty space in the hyperlink column.
3. Select Edit Hyperlink. The Define Hyperlink dialog opens.
4. Select from the options described below.

Use this option:	To do this:
Display Name	Type or paste text in the Display Name box. The text you enter here will display as hypertext in the column in lieu of the full path or address. For instance, you can have "AEC Homepage" display rather than "www.aecsoftware.com".
File or URL	Type or paste text in the File or URL box or use the Browse button to enter the exact path to a file.
Launch URL	Click the Launch URL button to test your links before entering them.

5. Click OK to close the Define Hyperlink dialog.

Launching a file or URL address

To open a file or URL (internet address) that is defined by the value in a hyperlink cell, click on the value in the hyperlink-defined column.

Notes:

For a successful launch, files must be entered as a complete path locally or on the network, not simply the file name.

If you click a hyperlink with the path "c:\My Documents\letter.doc," Microsoft Word opens and then the "letter.doc" file opens (assuming files with the '.doc' extension are set by default to open with Microsoft Word).



Image Columns

For schedules that require graphics within columns, use the available Image columns in FastTrack Schedule. There are ten Image columns in the Schedule View and ten Image columns in the Resource View.

To insert and edit an Image column:

1. Go to Insert > Column > select Image column
2. Once Image column is inserted into view, right-click (context-click) on the empty space in the image column.
3. Select Browse for image
4. Locate the desired image and select Open

Activity Name	Cover	Contents	Layout	November		
				1	8	15
FEBRUARY 2010 ISSUE PLANNING						
February Special Focus Issue...						
February 8, 2010 Issue						
Submit Copy, Photos & Artwork						
First Draft Due Date						
Determine # of Pages						
Layout						
Layout Approval						
Final Proofreading						
Final Approval						
Publication to Printer						
Printing						
Distribution						
February Issue...						

Image Size: 280 x 280

When hovering over image within the column, a larger size of the image will be displayed.



Column Descriptions

Column Name	Type	Description
% Complete	NUMBER	Percentage of activity completed
% Used	NUMBER	Percentage of a resource's time used
Activity Name	TEXT	Project tasks/activities
Activity Row ID	ID/CODE	ID to identify row
Activity Row Number	ID/CODE	Number to identify row
Actual Duration	DURATION	Duration of time it actually took an activity to be completed
Actual Finish Date	DATE	Date on which an activity actually finished
Actual Finish Time	TIME	Time activity actually finished
Actual Start Date	DATE	Date activity actually started
Actual Start Time	TIME	Time activity actually started
Attendees	TEXT	iCal/Outlook event attendees
Bar ID	ID/CODE	Unique identifier for bar
Bar Row ID	ID/CODE	Unique identifier for bar row
Baseline Cost 1 - 10	COST	Capture activity costs at up to 10 points in time for the lifetime of the project
Baseline Duration 1 - 10	DURATION	Capture activity durations at up to 10 points in time for the lifetime of the project
Baseline Finish Date 1 - 10	DATE	Capture activity finish dates at up to 10 points in time for the lifetime of the project
Baseline Finish Time 1 - 10	TIME	Capture activity finish times
Baseline Start Date 1 - 10	DATE	Capture activity start dates
Baseline Start Time 1 - 10	TIME	Capture activity start times
Baseline Work 1 - 10	WORK	Capture activity work
Calculation 1 - 100	CALCULATION	Define a formula to calculate data from the schedule
Constraint Date	DATE	Date to be used with constraint type
Constraint Time	TIME	Time to be used with constraint type and date
Constraint Type	ID/CODE	Parameter applied to activity to control its behavior as project changes
Cost 1 - 10	COST	Formatted to display monetary values
Critical	FLAG	Yes/No – Yes indicates that the activity is on the critical path
Date 1 - 10	DATE	Formatted to display dates
Duration 1 - 10	DURATION	Formatted to display durations
Early Finish Date	DATE	Earliest date activity can finish
Early Finish Time	TIME	Earliest time on Early Finish Date activity can finish
Early Start Date	DATE	Earliest date activity can start
Early Start Time	TIME	Earliest time on Early Start Date activity can start



Column Name	Type	Description
Effort Driven	FLAG	Yes/No - Yes indicates that the activity's duration is driven by resource effort
Finish Date	DATE	Originally estimated finish date "Scheduled"
Finish Date 1 - 10	DATE	Formatted to display dates
Finish Float	DURATION	Number of days activity's finish date can slip before project finish date is affected
Finish Time	TIME	Originally estimated finish time "Scheduled"
Finish Time 1 - 10	TIME	Formatted to display time
Fixed Cost	COST	Lump sum costs for the activity, feeds into Total Cost
Fixed Duration	FLAG	Yes/No - Yes indicates that the activity's duration is fixed and not recalculated automatically
Flag 1 - 20	FLAG	Formatted to display Yes/No option
Free Float	DURATION	Number of days an activity can slip before next activity is affected
Hyperlink 1 - 10	HYPERLINK	Formatted to display hyperlink items - email address, URL, file
Ignore Resource Calendars	FLAG	Yes/No - Yes indicates that the activity is to ignore the assigned resource's calendar
Image 1 - 10	IMAGE	Formatted to display images
Late Finish Date	DATE	Latest date an activity can finish before project finish date is affected
Late Finish Time	TIME	Latest time on Late Finish Date an activity can finish before project finish date is affected
Late Start Date	DATE	Latest date an activity can start before project finish date is affected
Late Start Time	TIME	Latest time on Late Start Date an activity can start before project finish date is affected
Location	TEXT	iCal/Outlook event location
Notes	TEXT	When text is entered, a notes indicator appears in the Information Form action column
Number 1 - 50	NUMBER	Customizable to display numerical values
Parent Tree	ID/CODE	Activity name complete with parent rows, when using outline levels
Predecessors	ID/CODE	Displays which activity row(s) an activity is dependent on, including link type and lag
Priority	ID/CODE	Number field to prioritize your tasks
Resource Cost	COST	Pre-defined calculation of the assigned resource's rate x work
Resources Assigned	ID/CODE	Linked to Resource View; defines assigned resources to activity
Revised Duration	DURATION	Revision to activity's scheduled duration
Revised Finish Date	DATE	Revision to activity's scheduled finish date
Revised Finish Time	TIME	Revision to activity's scheduled finish time
Revised Start Date	DATE	Revision to activity's scheduled start date
Revised Start Time	TIME	Revision to activity's scheduled start time
Start Date	DATE	Originally estimated start date "Scheduled"
Start Date 1 - 10	DATE	Formatted to display dates
Start Float	DURATION	Number of days activity's start date can slip before project finish date is affected
Start Time	TIME	Originally estimated start time "Scheduled"
Start Time 1 - 10	TIME	Formatted to display time



Column Name	Type	Description
Status	ID/CODE	Automatically calculated, based on % Complete, % Used and Current Dateline
Subproject Activity Row ID	ID/CODE	In a consolidated file, displays the original Row ID of activities in a subproject.
Subproject WBS	ID/CODE	In a consolidated file, displays the original numerical hierarchy of activities in a subproject based on their outline levels before consolidation.
Successors	ID/CODE	Displays which activity rows are dependent on what other activity rows, including link type and lag
Task Calendar	ID/CODE	Assign/Edit an activity's calendar (Standard, 24 hour, Nightshift, etc.)
Text 1 - 100	TEXT	Customizable to display text data
Time 1 - 10	TIME	Formatted to display time
Total Cost	COST	Pre-defined calculation of Fixed Cost + Resource Cost
Total Float	DURATION	Number of days activity can slip before project finish date is affected
Total Resource Duration	DURATION	The total duration, in hours, of resource work time allocated to an activity.
WBS	ID/CODE	A numerical hierarchy of activities based on outline levels.
Work	WORK	The amount of work hours available to be allocated to resources.



MODULE 5

Reporting (Layouts & Filters)



Module 5

Reporting (Layouts & Filters)

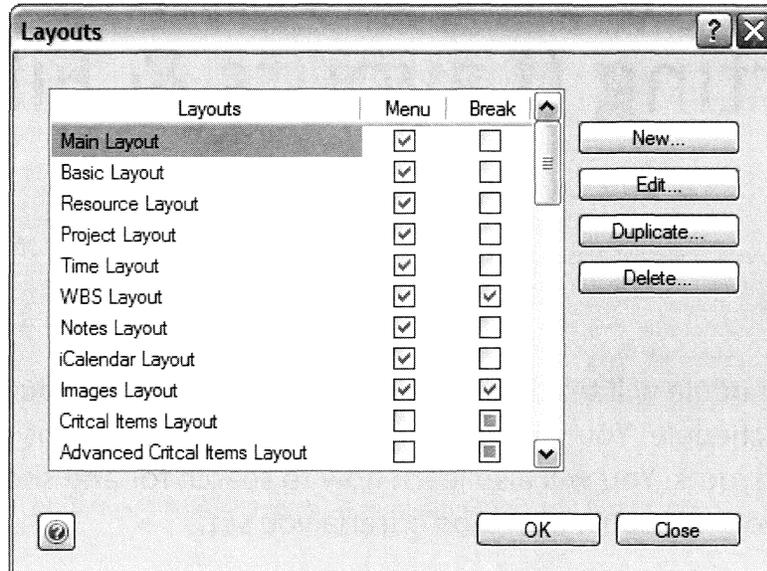
Overview: This module will teach you two features that will aid you in reporting data from your schedule. You will learn how to easily access groups of columns with the use of layouts. You will also learn how to search for and show specific rows of data in your schedule based on criteria you set.

- a. Understanding Layouts
- b. Creating Customized Layouts
- c. Understanding Filters
- d. Creating Column/Value Criteria Filters
- e. Creating Date/Time Criteria Filters
- f. Multi-Criteria Filters
- g. Resource View Filters



Understanding Layouts

Using layouts, you can create different combinations of columns and switch between them quickly and easily. Layouts can be customized to show columns, the timeline graph, timescales, and summary graphs. When it comes to reporting, you may be sharing your schedule with different people. Depending on the person and their relation to the project, the data you want to report may be different. The ability to set up a Layout for each person, if necessary, will come in very handy.



Creating Customized Layouts

Defining a layout allows you to create and edit views of the Schedule. Layouts are created and edited in the Layouts and Define Layout dialogs.

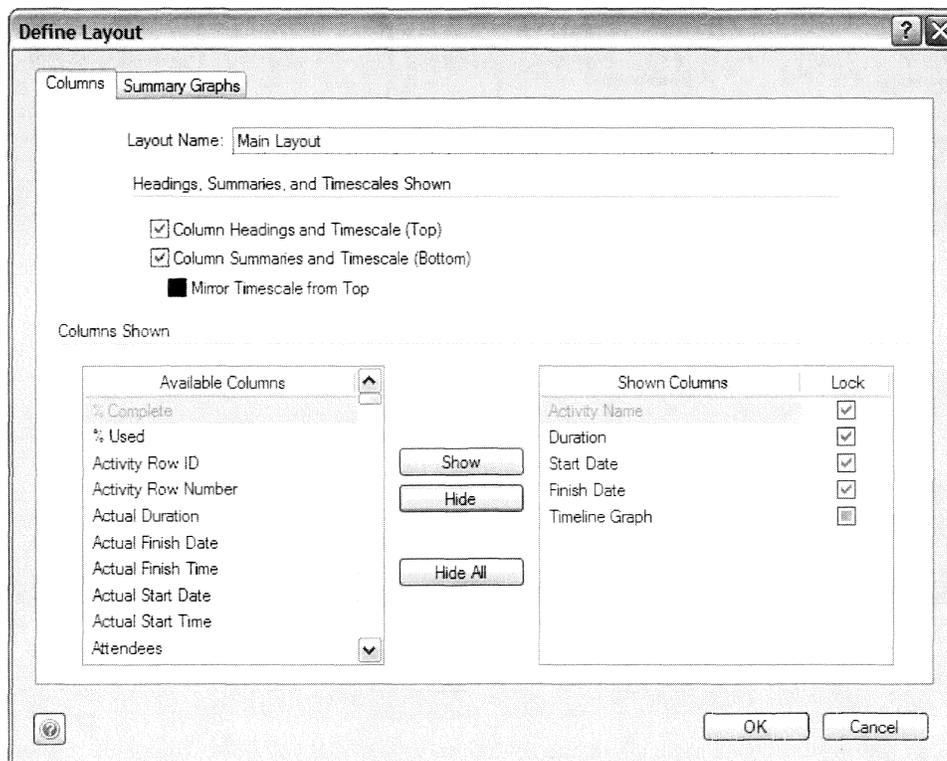
To open the Define Layout dialog:

1. Go to Project menu > Layouts > Define.
The Layouts dialog opens.
2. Click the New button to design a new layout.
-or-
Click the Edit button to edit the existing layout you select from the Layouts table.
The Define Layout dialog opens.



In the Columns tab of the Define Layout dialog:

1. In the Layout Name box, enter or edit the layout name.
2. From the Available Columns table, select a column name.
3. Click the Show button to send the column to the Shown Columns table.
4. Repeat this process until all the columns you want to include in the layout are in the Shown Columns table.
-or-
Click the Hide button to remove a column from the Shown Columns table.
5. If you wish, click and drag on column names in the Shown Columns table to change the order of columns in the layout.
You can place columns on either side of the timeline graph.
6. If you wish, click in the Lock column to lock or unlock the column.
Locking a column prevents it from scrolling out of the window. It can be used for setting the left and right scroll boundaries of the schedule.
7. Select Column Headings & Timescale (Top) to display column headings and the top timescale area.
8. Select Column Summaries & Timescale (Bottom) to display column summaries and a bottom timescale area.
9. Select Mirror Timescale from Top to display a bottom timescale that mirrors the top timescale.
Column Headings and Timescale (Top) must be selected if you want to mirror the top timescale.





Locking Columns

You can lock columns to the left and right of the timeline. If you do so, then only the area between the columns will scroll. This allows you to keep the timeline and locked columns in view.

To lock a column:

1. Select the column you want to lock by clicking in that column's heading.
2. Right-click and select Lock.

To unlock a column:

1. Select the column you want to unlock by clicking in that column's heading.
2. Right-click and select Unlock.

	Activity Name	October	November	December	January	February	Duration (Days)	Revised Duration (Days)	Original Estimate	Revised Estimate	Variance	
1	▶ Lot 160...	[Timeline bar]						139.0	139.0	\$187,676	\$207,176	\$-19,500
59	▼ Lot 188	[Timeline bar]						139.0	139.0	\$188,773	\$197,723	\$-8,950
60	Draw #1						0.0	0.0	\$0	\$0		
61	Accept Lot						0.0	0.0	\$55,100	\$55,100		
62	Stake lines and grades						2.0	5.0	\$2,500	\$3,250	\$-750	
63	Cleaning and Site Grading						5.0	6.0	\$3,500	\$7,700	\$-4,200	
64	Utilities						6.0	7.0	\$5,500	\$9,500	\$-4,000	
65	Excavation						2.0	2.0	\$3,300	\$3,300		
66	▼ Foundation and backfill						13.9	13.9	\$17,498	\$17,498		
67	Footings inspection						0.0	0.0	\$0	\$0		
68	Footings						3.0	3.0	\$8,304	\$8,304		
69	Slab on grade						3.0	3.0	\$4,104	\$4,104		
70	Walls						5.0	5.0	\$5,090	\$5,090		
71	Draw #2						0.0	0.0	\$0	\$0		
72	▼ Finish Selections						10.0	10.0	\$0	\$0		
73	Erect walls, floors, and roof						19.0	19.0	\$17,650	\$17,650		
74	Roofing						6.0	6.0	\$3,200	\$3,200		
75	Window Systems						11.0	11.0	\$18,000	\$18,000		
76	▼ Exterior wall surfaces						17.0	17.0	\$11,450	\$11,450		
77	Brick and vinyl siding						13.0	13.0	\$6,600	\$6,600		
78	Exterior trim						4.0	4.0	\$2,850	\$2,850		
79	Draw #3						0.0	0.0	\$0	\$0		
80	▶ Rough-in ductwork, plumbing, and electrical						7.4	7.4	\$4,900	\$4,900		
85	Close-in inspection						0.0	0.0	\$0	\$0		
86	▶ Drywall						19.0	19.0	\$7,225	\$7,225		
91	▶ Painting						8.0	8.0	\$5,680	\$5,680		
94	Draw #4						0.0	0.0	\$0	\$0		
95	▶ Finish Carpentry						19.0	19.0	\$11,735	\$11,735		
100	▶ Flooring						23.0	23.0	\$8,015	\$8,015		
103	▶ Plumbing, heating, and electrical finish work						9.0	9.0	\$5,125	\$5,125		
107	Draw #5						0.0	0.0	\$0	\$0		
108	▶ Walks, Drive Aprons, and						19.0	19.0	\$8,295	\$8,295		
							T.	479.4	Tot. 484.4	\$564,907	\$601,857	\$-36,950

Notes:

You can lock one column to the left of the timeline and one column to the right. If you do so, then only the area between the locked columns will scroll.

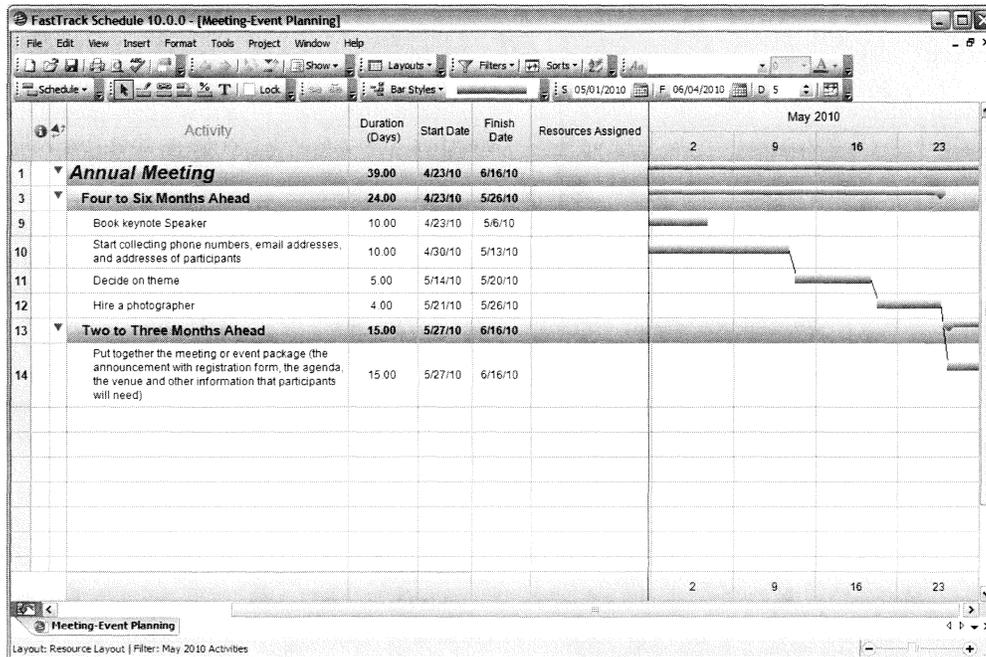
You can also lock and unlock columns within the Columns tab of the Define Layout dialog, accessed through the Schedule menu.

Locked columns can also be used to define which columns will repeat on every page when you print. This is defined in File > Page Options dialog.



Understanding Filters

As projects get larger, it can be more difficult to find specific information. Filtering uses search criteria that you define to identify information in rows. It then allows you to hide or select activities that match the criteria. Filters can be based on specific values in columns, like a particular department in a Department column, or they can be based on specific time constraints. For example, you may only want to see activities that are happening in May 2010.



Restoring hidden rows

As soon as you run a filter, the rows that do not match the search criteria disappear. Once rows have been hidden, through the menu or with a filter, you can show them again by restoring rows. This shows all hidden rows and rearranges them so that they resume their original, Master Sort order.

To restore hidden rows:

1. From the Project menu > Filters > select Restore All.

-or-

Click the Restore All button in the bottom-left corner of the schedule.



To define Restore All options:

1. Go to Tools > Document Options > General tab.

Warning:

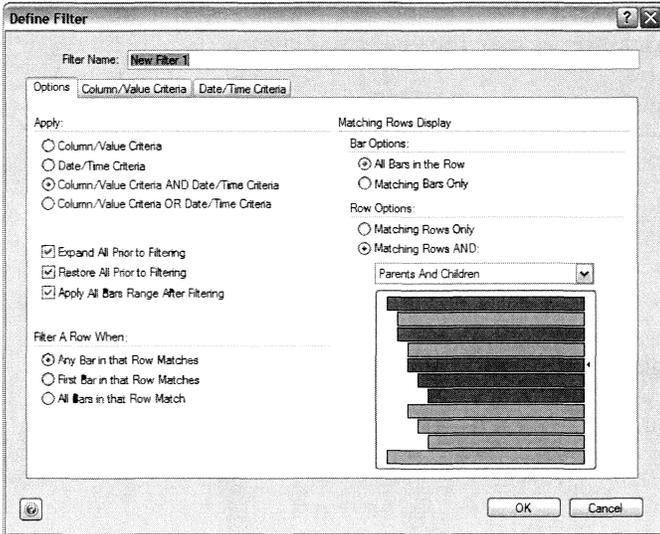
When you are viewing your schedule in a filtered state (red arrow appears on the bottom-left corner), DO NOT modify row order. This means do not insert, move, or delete rows while data is being filtered. Filtering your schedule is for reporting and viewing purposes, not modification.

Because rows are hidden while in a filtered state, modifying row order can be confusing to FastTrack Schedule. For example, it would not know where you would like to move a row in relation to hidden rows, if you were to do so.



Filter Options

In the Options tab of the Define Filter dialog, you organize every aspect of a filter. In this tab, you determine which type of criteria to apply, what constitutes a filter-matching activity, and which outline levels and bars will display when the filter is applied.



Filter A Row When Options:

This option:	Means:
Any Bar in that Row Matches	In rows with multiple bars, if any of a row's bars meets the filter criteria, that row will be shown or selected.
First Bar in that Row Matches	In rows with multiple bars, only those rows whose first bar meets the filter criteria will be shown or selected.
All Bars in that Row Match	In rows with multiple bars, a row will be shown or selected only if every bar in that row meets the filter criteria.

To use the Options tab of the Define Filter dialog:

This option:	Means:
Column/Value Criteria	In order to be shown or selected by this filter, an activity must meet only the criteria defined in the Column/Value Criteria tab.
Date/Time Criteria	In order to be shown or selected by this filter, an activity must meet only the criteria defined in the Date/Time Criteria tab.
Column/Value Criteria AND Date/Time Criteria	You are applying the filter criteria you laid out in both the Date/Time and Column/Value Criteria tabs. In order to be shown or selected by this filter an activity must meet the criteria defined in both of those tabs.
Column/Value Criteria OR Date/Time Criteria	You are applying the filter criteria you laid out in both the Date/Time Criteria and Column/Value Criteria tabs. In order to be shown or selected by this filter an activity need only meet the criteria defined in either one of those tabs.



Matching Rows Display Options:

This option:	Means:
Bar Options:	
All Bars in the Row	In rows with multiple bars, every bar in the row will display if any bar in the activity meets the filter criteria.
Matching Bars Only	In rows with multiple bars, only those bars that meet the filter criteria will display.
Row Options:	
Matching Rows Only	The filter will show or select only those activities that meet the filter criteria, on any visible outline level.
Matching Rows AND Parents	The filter will show or select the activities that meet the filter criteria and the activities one or more level up in the same outline.
... AND Children	The filter will show or select the activities that meet the filter criteria and any subactivities one or more outline level below.
... AND Parents and Children	The filter will show or select the activities that meet the filter criteria; the activities one or more level up in the same outline; and any subactivities one or more outline level below.
...AND Families	The filter will show or select every activity on every level of the outline for those activities that meet the filter criteria.

Prior to/After Filtering:

This option:	Means:
Expand All Prior to Filtering	When applying a filter, only visible rows are searched. Before the filter is performed, all subactivities will be displayed.
Restore All Prior to Filtering	<p>When applying a filter, only visible rows are searched. For example, the state of your rows may already have a filter applied. To avoid applying a filter to filtered results, select this option. All rows are restored before the filter is performed.</p> <p>Restoring does not necessarily return your View to the same appearance it had before you hid rows. If you have made changes that affect the order of activities, these changes cannot be restored. Changes that affect the order of rows include: moving, inserting, deleting, cutting, and pasting rows.</p>
Apply All Bars Range After Filtering	After the filter is applied, your timeline range will begin on the earliest activity Start Date/Time and end on the Finish Date/Time of the latest scheduled activity.



Creating Column/Value Criteria Filters

You set the criteria for a Column/Value filter in the Column/Value Criteria tab of the Define Filter dialog. Criteria you set in this tab can then be used as part of or the entire filter that you define in the Options tab.

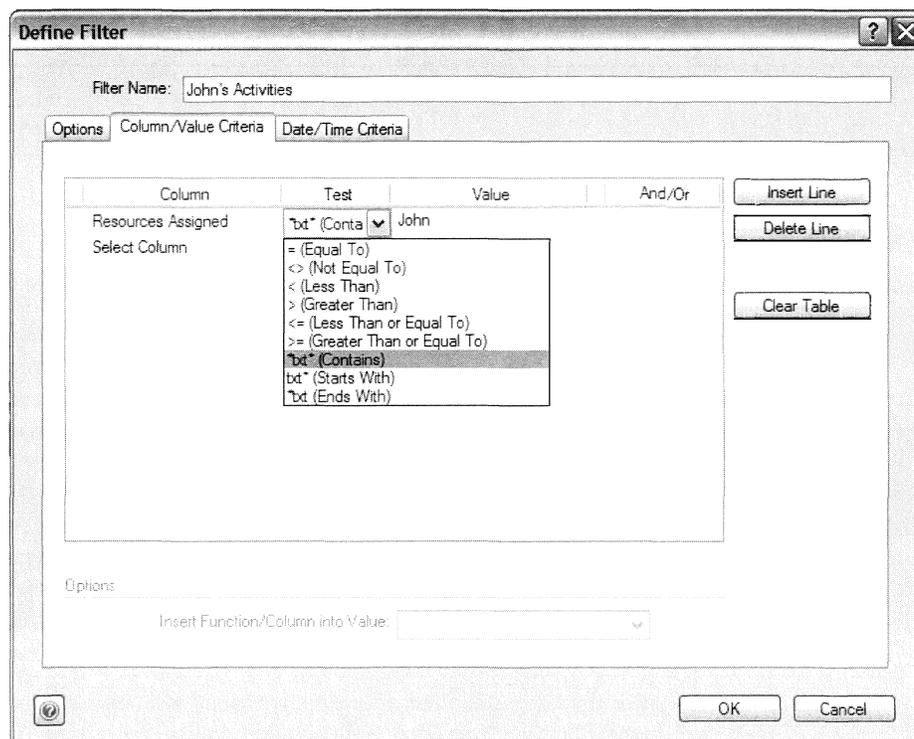
To use the Column/Value Criteria tab of the Define Filter dialog:

1. Go to Project > Filters > Define. The Filters dialog opens.
2. Click the New button to create a new filter.
3. In the Filter Name box, enter a name for your filter.
4. Click the Column/Value Criteria tab.
5. From the Column value list, click to select a column in which to search for the Value, for instance, Resources Assigned.
6. Click the Test cell in the table.
7. From the Test value list, select the appropriate comparer for the column value, for instance, Contains.
8. Click the Value cell in the table.
9. Enter a value to look for in the specified column, for instance, a Resource Name.

-or-

From the Insert Function/Column into Value value list, select a column or function.

A function is a value that represents a variable. The filter is saved for future use.



Notes:

If you have defined a value list for a column, that value list will appear in the Value cell when the column is selected in the Column cell.



Creating Date/Time Criteria Filters

You set the criteria for a Date/Time filter in the Date/Time Criteria tab of the Define Filter dialog. Criteria you set in this tab can then be used as part of or the entire filter that you define in the Options tab.

To create a date/time filter:

1. Go to Project > Filters > Define. The Filters dialog opens.
 2. Click the New button to create a new filter. The Define Filter dialog opens. The Define Filter dialog has three tabs.
 3. Use the Date/Time Criteria Tab in the Define Filter dialog to create a filter using the options described below.
 4. Click OK to save your changes and close the Define Filter dialog.
 5. Click OK to apply the selected filter and close the Filters dialog.
- or-**
- Click Close if you do not want to apply the filter at that time. The filter is saved for future use.

Define Filter

Filter Name: John's Activities for Next Month

Options | Column/Value Criteria | **Date/Time Criteria**

Define

Bars: Revised Component

Starts In Is Contained In
 Ends In Spans

Date/Time Range

Next Month

From (Start) To (Finish)

Start Date: 03/01/10 Start Time: 12:00 AM Finish Date: 03/01/10 Finish Time: 12:00 Mid

Calculation Define... Calculation Define...

Range Starts Prior to Start By: Range Ends After Finish By:

0 0

Calculation Define... Calculation Define...

Units: Hours Units: Hours

OK Cancel



To use the Date/Time Criteria tab of the Define Filter dialog:

This option:	Does this:
Bars (component)	Sets the date/time filter to look only at the Scheduled, Revised, or Actual component of activity bars in the schedule.
Starts In	Asks the filter to search bars whose selected component starts in the specified date/time range.
Ends In	Asks the filter to search bars whose selected component ends in the specified date/time range.
Is Contained In	Asks the filter to search bars whose selected component is contained within the specified date/time range.
Spans	Asks the filter to search bars whose selected component contains, within its dates and times, the specified date/time range.

This option:	Does this:
Current "X"	Allows you to select from a pop-up list a dynamic date/time range, based on the current date. Select from Current Hour, Day, Week, Month, Quarter, or Year.
Custom Defined Range	From the value list, select Custom Defined Range. This allows you to define, using the numerous options provided, a range of dates and/or times that will act as the filter's specified date/time range. You can set a Start Date/Time and a Finish Date/Time or use a calculation to be the basis of your custom range. Then, you can choose to have the range start or finish a select number of units before or after the custom range. For example, this could allow you to filter for the month of October plus an additional 14 days.

Notes:

The default setting in the Options tab of the Define Filter dialog is to restore and expand all rows prior to filtering. If these options are changed and a row, activity bar is not displayed because it is hidden or collapsed, that data is not searched.

Any changes you make to the order of rows while rows are hidden may not be restored. Changes that affect the order of activities include: moving rows, inserting rows, deleting rows, cutting rows, and pasting rows.



Multi-Criteria Filters

Multiple criteria can be applied in a single filter by entering additional lines in the column/value table. Multiple lines must be separated with "And" or "Or" in the And/Or column on the right of the table. Click under the column to select one.

"And" narrows the search as the activity must meet both criteria.

"Or" expands the search as the activity can meet either criteria. To group multiple criteria together to change their meaning, click the parentheses cells ().

A multi-criteria filter can also include Date/Time criteria. After creating a filter for a specific column/value, add a date/time criteria to narrow down the found results.

Resource View Filters

In the Resource View, Column/Value criteria filters can also be defined in the same way as in the Schedule View. Since the Resource View's focus is on resource allocation and assignments, Assignment Criteria filters can also be defined. For example, maybe when it comes time to assign resources for the next month, you may want to see which resources are assigned comfortably so that they can be assigned to more activities.

Define Filter

Filter Name: Resources Assigned Comfortably Next Month

Options | Column/Value Criteria | Assignment Criteria

Assignment

Resource Not Assigned

Resource Assigned Comfortable (0-99%)

Resource Assigned At Full Normal Capacity (100%)

Resource Over Assigned (> 100%)

Check Assignment across Date/Time Range

Next Month

From (Start) To (Finish)

Start Date Start Time Finish Date Finish Time

OK Cancel

To define an Assignment Criteria filter:

1. In the Resource View, go to Project > Filters > Define.
2. Select the Assignment Criteria tab.
3. Select the desired Assignment percentage and if appropriate, a specified Date/Time Range.
4. Select OK to save the filter.
5. Select OK to apply the filter.

Notes:

If you want to create another filter similar to one you have already created, you can duplicate a filter in the Filters dialog.



MODULE 6

Baselines & Progress Tracking



Module 6

Baselines & Progress Tracking

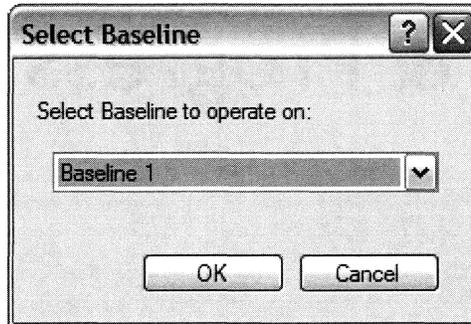
Overview: After completing this module, you will know how to track the progress of your schedule using baseline, revised date, and actual date columns. You will also learn how to interpret the % Used and Status columns.

- a. Understanding Baselines
- b. Progress Tracking
- c. Tracking with Dependencies
- d. Revised Dates
- e. Percent Complete and Actual Dates
- f. % Used and Status Columns



Understanding Baselines

Baselines are derived from key schedule information columns that have been saved as a snapshot of the schedule at that point in time. These snapshots of information contain Cost, Work, Duration, Start Date, Start Time, Finish Date, and Finish Time. The data captured is taken from Total Cost, Work, Revised Duration, Revised Start Date, Revised Finish Date and Revised Finish Time columns. Each project can have up to 10 baselines. Captured information stored in baseline columns are not tracked on the timeline graph.



To save a baseline:

1. Go to Tools > Progress Tracking > Save Baseline.
The Select Baseline dialog box appears.
2. Select Baseline 1, or if you have already saved a baseline, select the next available baseline.
3. Click OK to save the baseline
4. Baseline Information can be viewed by inserting corresponding baseline columns.

Baseline Layouts

Newly created files have pre-defined layouts for each set of baseline columns. To access these layouts, go to the Project menu > Layouts > Define > navigate to Baseline 1 Layout, Baseline 2 Layout, etc.

Activity Name	Baseline Duration 1	Baseline Start Date 1	Baseline Start Time 1	Baseline Finish Date 1	Baseline Finish Time 1	Baseline Work 1	Baseline Cost 1



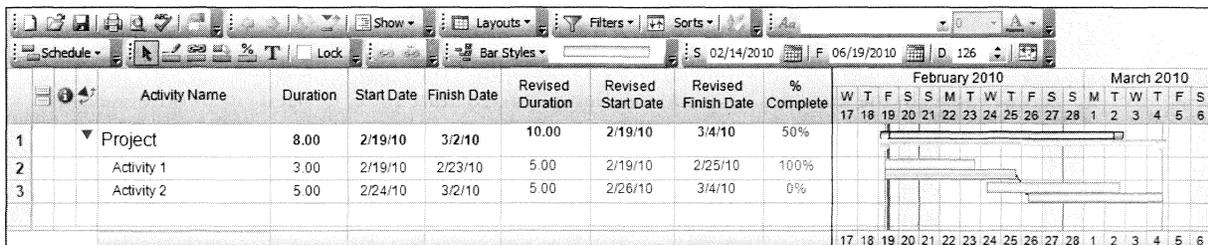
Progress Tracking

The activities in an on-going project are always in the flux and scheduling changes are inevitable. Progress Tracking allows you to track and view changes to the Start, Finish and Duration of activities throughout the life of your project.

At all times, FastTrack Schedule automatically tracks the progress of activities as three sets of dates:

- **Scheduled** – Dates that reflect when your schedule was originally planned, also called the "baseline" or "promised" dates.
- **Revised** – Dates as they are currently projected, accounting for adjustments since the project began.
- **Actual** – Dates as they actually happened, also tracked as a percentage complete, or "work-in-place".

When you draw a bar with the Draw Bar tool or enter data in Start, Finish, or Duration columns, you are entering the Scheduled dates. The label "Scheduled" is omitted from the columns to facilitate scheduling by users who do not wish to employ progress tracking.



Tracking with Dependencies

Linking activities throughout the schedule creates dependencies and allows you to see how changing one bar will affect the final outcome of the schedule. If you revise a bar that has a dependency, the dependency may also be revised.

Revising linked bars may move the selected bar and all bars which are dependent upon it. A dependent bar will not move, however, if moving would conflict with that dependent bar's Constraint Type parameters, or if the activity represented by the dependent bar has actually started.

When you drag a revised bar, moving that bar beyond its Constraint Type's parameters will cause the Constraint Type to change to "Start On Or After".

To revise a linked activity by dragging:

1. Select the Revise Bar Tool on the Toolbox toolbar
2. Click either the linked point or the middle of the bar and drag to the left or right.

In order for the Progress Tracking feature to work to its fullest potential, activities' dependencies must be defined.

Notes:

While dragging a linked bar, only the selected bar moves. Dependent bars, if their constraints allow the move, move only once you stop dragging the selected bar and release the mouse.



Revised Dates

Defining an activity's Revised dates and times updates the currently projected start, finish, and/or duration of the activity.

For instance, if changes to earlier activities force an activity to slip, thus starting and ending later, this new start, finish and duration data can be entered as Revised data. This leaves the Scheduled data as it was originally planned, allowing you to see the difference between the original schedule and the currently projected schedule.

You can define a task's Revised dates in the Schedule and Calendar Views. If a task has been assigned to a resource, you can also revise its dates in the Resource View.

To define Revised dates by dragging:

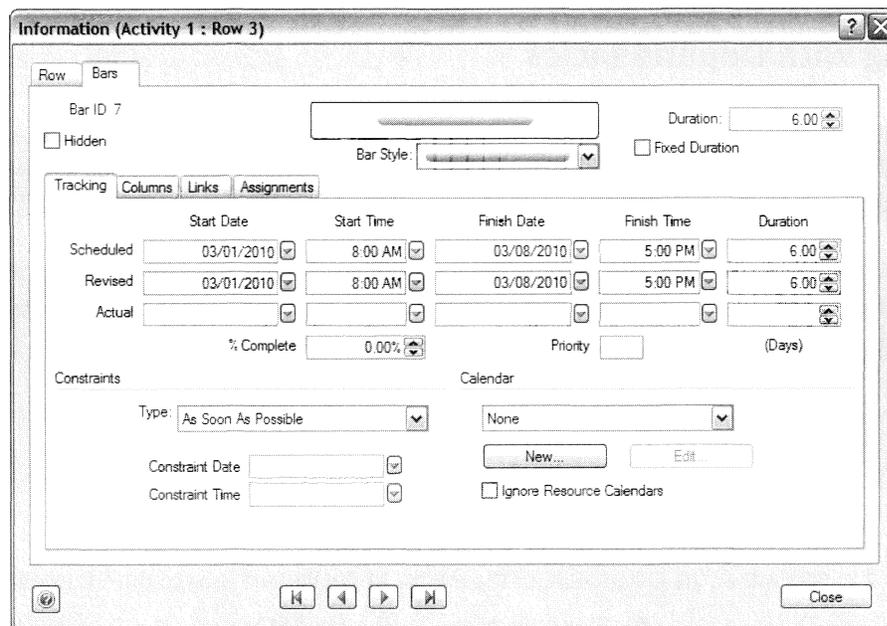
1. In the Toolbox, select the Revise Bar tool. 
2. Clicking and holding the left mouse button down, drag the activity bar to the right or left and release your mouse.

To define Revised dates by typing:

1. If not already displayed, show the Revised date, time and/or duration columns by switching layouts (Project > Layouts > Tracking) or by going to the Insert menu > Column.
2. Enter values in the activity's Revised Start Date, Revised Start Time, Revised Finish Date, Revised Finish Time, or Revised Duration columns.

-or-

Click in the Information Form action column, select the Bars tab > Tracking tab, and enter values in the Revised Date/Time and Duration boxes.



	Start Date	Start Time	Finish Date	Finish Time	Duration
Scheduled	03/01/2010	8:00 AM	03/08/2010	5:00 PM	6:00
Revised	03/01/2010	8:00 AM	03/08/2010	5:00 PM	6:00
Actual					

% Complete: 0.00% Priority: (Days)

Constraints: Type: As Soon As Possible Calendar: None

Constraint Date: Constraint Time: Ignore Resource Calendars

Buttons: New... Edit

Close

Notes:

The display of the Revised data on the bar is defined by the format of the bar style. The Revised dates appear as another bar or extending points and can be shown all of the time or just when they differ from the Scheduled dates. These options can be formatted by formatting the bar style.



Percent Complete and Actual Dates

Percent Complete and Actual data indicates how much work has been done on a task. You can always define a task's Actual dates from the Schedule and Calendar Views and, if a task has been assigned to a resource, you can also edit its Actual dates from the Resource View.

To define % Complete by drawing:

1. In the Toolbox, select the Bar Percent Complete tool. 
2. Click a position in the bar that represents the percentage of the task that has been completed thus far.

To define % Complete by typing:

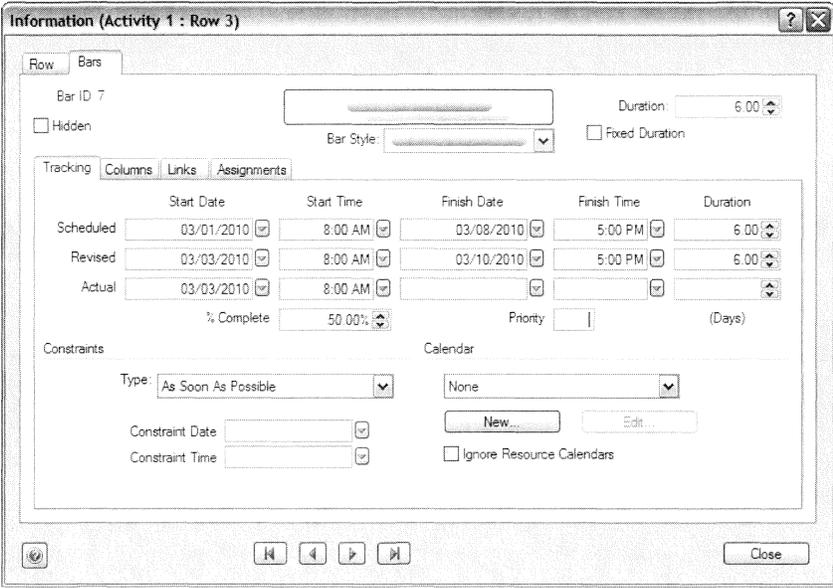
1. Insert > Column > % Complete
2. Enter a number in the % Complete column.

To define Actual dates by drawing:

1. In the Toolbox, select the Bar Percent Complete tool. 
2. Click anywhere to the right of the start point of the bar to enter the Actual Start Date and Time. Click the end of the bar to enter the Actual Finish Date and Time and Actual Duration

To define Actual dates by typing:

1. If not already displayed, Insert > Column > Actual Start Date/Actual Finish Date/Actual Duration
 2. Enter values in the corresponding columns.
- OR-
- Click in the Information Form action column, select the Bars tab > Tracking tab, and enter values in the Actual Date/Time and Duration boxes.



	Start Date	Start Time	Finish Date	Finish Time	Duration
Scheduled	03/01/2010	8:00 AM	03/08/2010	5:00 PM	6:00
Revised	03/03/2010	8:00 AM	03/10/2010	5:00 PM	6:00
Actual	03/03/2010	8:00 AM			

% Complete: 50.00% Priority: | (Days)

Constraints: Type: As Soon As Possible Calendar: None

Constraint Date: Constraint Time: Ignore Resource Calendars:

% Used and Status Columns

The % Used and Status columns are columns to help report the progress of each activity, relative to the current date and the manually entered % Complete. At a glance, you can see which activities are on schedule or behind schedule. To insert these columns, go to Insert > Columns > select % Used or Status.



MODULE 7

Styles (Outlines, Rows, Bars)



Module 7

Styles (Bars, Rows, Outlines)

Overview: This module will show you how to define and apply formatting styles, which will help enhance the presentation quality of your schedules.

- a. Outline Level Styles
- b. Modifying Bar Styles
- c. New Bar Styles
- d. Dynamic Labels
- e. Timeline Graph



Outline Level Styles

Formatting rows allows you to set the height, background color and pattern, and bottom line color and pattern of rows.

To format rows in the Schedule View:

1. Select the row or rows by clicking on the row number column
2. Go to Format > select Row.
-or-
Double-click the Row Number column. Format row dialog will appear:

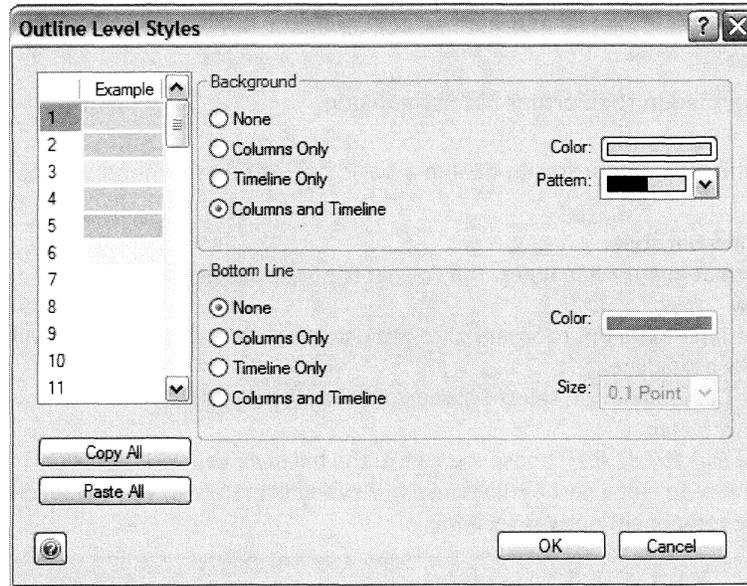
This Option:	Does this:
Use Outline Styles	Allows you to format the appearance of a row in relation to its outline level.
Define Outline Styles	Once clicked, opens the Outline Level Styles dialog in which you can set the background and bottom line colors and patterns for each outline level.
Background	
Color	Sets a background color to display in the row.
Pattern	Sets a background pattern to display in the row.
Display Location	Allows the color and pattern you have selected to display on: columns only, the timeline only, the columns and timeline, or not at all.
Bottom Line	
Color	Sets a bottom line color to display in the row.
Pattern	Sets a bottom line pattern to display in the row.
Size	Sets a line size for the bottom line pattern you are opting to display in the row.
Display Location	Allows the color pattern and line size to display on: columns only, the timeline graph only, the columns and timeline, or not at all.

Formatting Rows by Outline Level

The row background and bottom lines can also be set by outline level. For instance, you could apply a different background color to rows in outline level 1 and 2.

To change the formatting of rows by outline level:

1. In the Schedule View, double-click in the row number column of any row
Format Row dialog should appear.
2. In the Display tab, select the Use Outline Styles checkbox.
3. Select the Define Outline Styles button.
4. From the Outline Level table (left side), select the outline level you wish to format.
5. Select from the options described in the Format Row dialog above.



Modifying Bar Styles

Editing an existing bar style changes the appearance of the bar style, and every instance of that bar style in the schedule.

To edit the appearance of a bar style:

1. From the Format menu > select Bar Styles.
The Format Bar Style dialog opens.
2. Select the bar style you want to format from the list of bar styles
3. From the Part to Edit list, select the bar element you want to edit.

-or-

In the picture of the bar at the top of the dialog, click on the bar element you want to edit.

4. Based on the choice you have made, use the options described below.

To change this:	Do this:
Point/Milestone Shape	From the Shape list, select an existing point style and size. Click the New button to create a new point style or the Edit button to edit an existing point style. You can even insert an image as a point shape.
Bar/Milestone Pattern/Fill	From the Bar/Milestone Pattern/Fill area, select a color, pattern, and size.
Bar/Milestone Border	From the Border area, select a color and size.
Part Position Relative to Bar Style	From the Offsets area, select the horizontal and vertical alignment.

5. Click OK to apply your changes and close the Format Bar Style dialog.



New Bar Styles

New Bar Styles can be defined in the Format Bar Style dialog.

While you can select options in any order, to design a basic bar, we recommend you do the following.

To create a new bar style:

1. Go to Format menu > Bar Styles. The Format Bar Style dialog opens.
2. Click New
3. From the Type value list, choose Bar (to track start, finish, and duration) or Milestone (to track a single date like a deadline).
4. From the Component list, select Scheduled, Revised, or Actual.
5. Click the Parts tab.
6. From the Part to Edit list, choose the part of the bar style you wish to format.
7. If you choose to edit a part of the Actual or Revised component, you will receive the following choices in the component options section:

Options:	Does this:
Show Revised as a Bar	Displays the Revised component as a bar positioned relative to the Scheduled bar.
Show Revised as Points	Displays the Revised component as points extending off of the Scheduled points.
Always Show Revised	Shows the Revised component all of the time.
Show Revised Only if Different than Scheduled	Shows the Revised component only when the bar's Revised dates differ from the Scheduled dates.
Show Actual as a Bar	Displays the Actual component as a bar positioned relative to the Scheduled bar.
Show Actual as a Fill	Displays the Actual component as a pattern and color filling the Scheduled or Revised bar.

8. If you receive these options, based on your selections above, choose attributes in the Shape, Color, Pattern, Size, Border, and Offsets areas.
9. If you want to format other components of the bar or milestone, select them from the Component pop-up list and select their formatting options.
10. Click OK to accept the new bar style and add it to the Bars Styles Toolbar.

Notes:

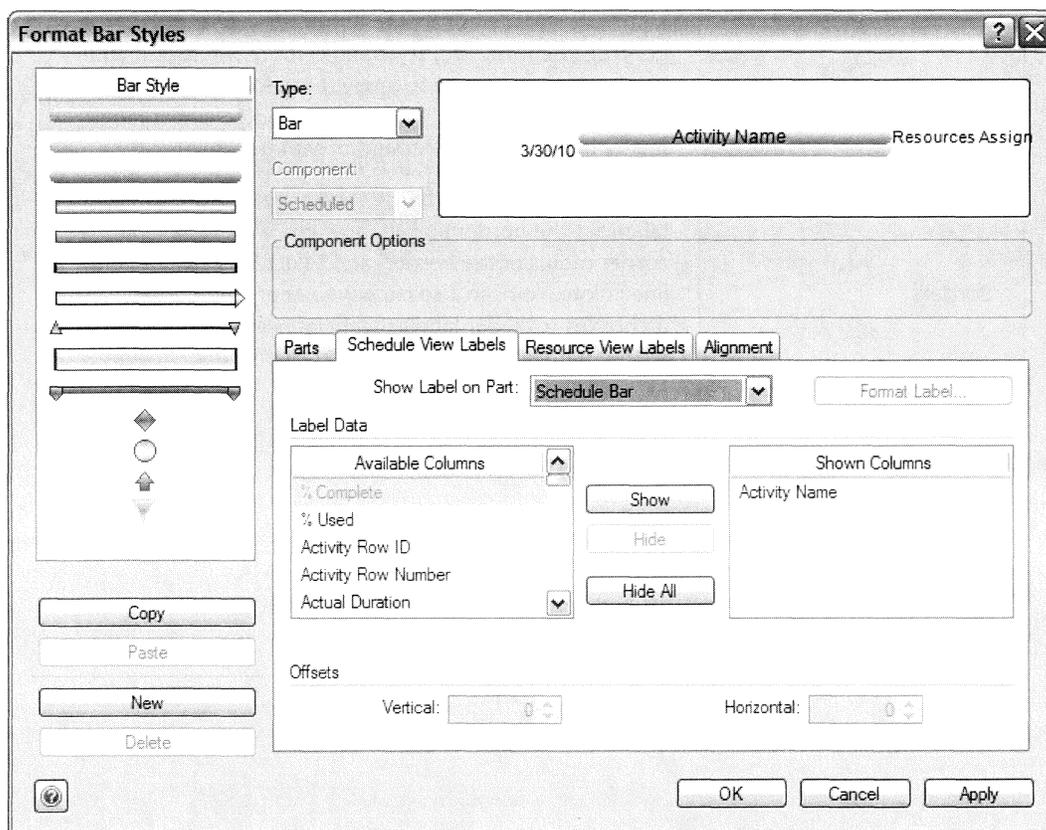
You can even create milestones from an image. With a new milestone created, in the Format Bar Styles dialog, go to the Parts tab > Shape > New... > Insert... > locate desired image.



Dynamic Labels

To emphasize certain data, you can attach text to a bar style. You can add date, time, duration, % complete, and other row or bar information as the label. Labels can be attached to a bar or milestone. You can have as many labels on an item as you wish.

In the Format Bar Style dialog you can create separate Schedule labels and Resource labels. You can also apply Schedule labels to bars in the Resource View. Bar labels created in the Format Bar Style dialog do not display in the Calendar View. Use the Format Calendar View dialog to create bar labels in the Calendar View.





To show data on a bar:

1. Go to Format menu > Bar Styles and select the bar style you want to apply labels to.
2. Click the Schedule View Labels or Resource View Labels tab.
3. If you wish to apply the same labels that are set in the Schedule View Labels tab to bars in the Resource View, click the Use Schedule View Labels checkbox.
4. From the Show Label on Part pop-up list, select on which part of the bar you would like to display data.
5. From the Available Columns table, select the column which contains the data you would like displayed on the bar.
6. Click the Show button to send the data to the Shown Columns table.
7. In the Offsets boxes, enter the Horizontal and Vertical distance from the selected element.
8. If desired, click the Format Label button to open the Format Bar Label dialog and access the options described below:

This tab:	Does This:
Font	Controls the font, size, style and color of the text in your labels. You can choose to apply these font attributes to a selected cell only (e.g. Activity Name) or to all bar labels (every label on every element of that bar style).
Borders	Allows you to: place a border and a shadow around a bar label, set the border and shadow line widths, set the corner radius of the border, and select background and line colors. You can also choose to apply the border attributes to all bar labels (every label on every element of that bar style) or to a selected cell only (e.g. Activity Name).
Display	Determines the appearance of any numbers, dates, times, and duration data in the Shown Columns table.

9. If you have chosen to format the bar label, click OK to apply your changes and close the Format Bar Label dialog.
10. Click OK to apply your changes and close the Format Bar Style dialog.



Timeline Graph

Formatting gridlines defines the display of gridlines in columns and the timeline graph.

To format gridlines in a timeline:

1. From the Format menu, select Gridlines.
2. Select from the options described below.
3. Click OK to apply your changes and close the dialog.

This Option:	Does This:
Define Gridlines	
Optimize	Automatically defines separate gridlines for display and printing. When displayed on screen, gridlines are gray or dotted. When printed to a dot matrix printer, gridlines are dotted. When printed to a high-resolution printer (300 dpi or greater), gridlines are solid hairlines.
Custom Setting	Allows you to design your own gridlines. Define the size, style, and color of the gridlines.
Show Gridlines	
Column Horizontal	Displays horizontal gridlines in columns.
Column Vertical	Displays vertical gridlines in columns.
Timeline Horizontal	Displays horizontal gridlines in the timeline graph.
Timeline Vertical	Displays vertical gridlines in the timeline graph.
Gridline Divisions Per Timeline Unit	Allows you to subdivide a timeline unit with the number of gridlines you specify. Enter the number of columns you want shown within each timeline unit.



MODULE 8

Printing & Visual Enhancing



Module 8

Printing & Visual Enhancing

Overview: In this module, you will learn how to visually enhance your schedule, print out your schedule, and export your schedules in other formats.

- a. Timeline Range Toolbar
- b. Print Preview
- c. Page Options
- d. Print Setup
- e. Headers & Footers
- f. Legends
- g. Text Boxes
- h. Pictures
- i. Exporting as picture
- j. Export iCal/Outlook, 3rd party applications
- k. Formatting the Calendar View



Timeline Range Toolbar

The Schedule View can show a different span, or range, of dates. The Timeline Range Toolbar gives you immediate access to the begin date and end date of the timeline graph.

The dates you set in the Timeline Range Toolbar affect only the View at which you are looking. If you want to apply a date range to all views as the Master Range, go to Format > View > Range tab, define the Start and Finish dates/Duration and select "Save Range as the Master Range".



All Bars Range

Applying the All Bars Range automatically adjusts the timeline to begin on the Start Date/Time of the earliest task and end on the Finish Date/Time of the latest task, immediately giving you a view of every bar and milestone in your schedule.

Timeline Units

When viewing schedules that are longer than a couple months it is difficult to see the entire project if the timeline is viewed in days. Go to the Project Menu > Timeline Units to change units to hours, days, weeks, months, quarters, or years.

Notes:

Dates entered in the QuickRange Toolbar are temporary and are not saved in the Ranges Toolbar. If you want to define a range for future use in the file, go to the Project menu > Timeline Ranges > Define > select New.

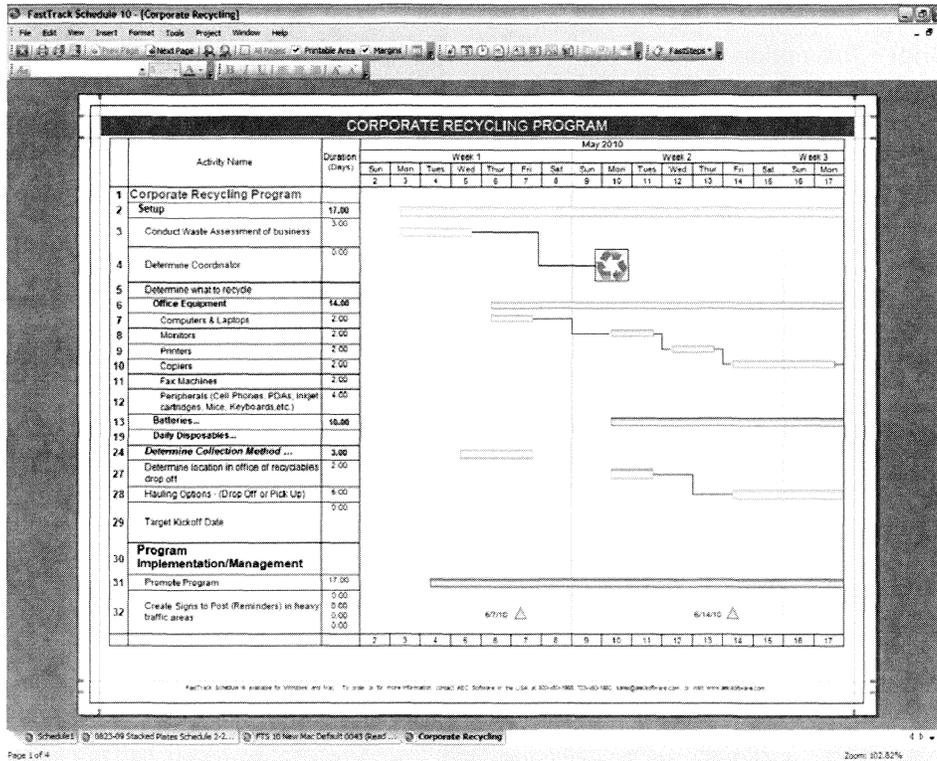
Trainer's Tip:

For easy navigation in the timeline graph, you can use the Go To Bar command to take you to the first bar in a selected row. Go to Edit menu > Go to > Bar (or use the shortcut Ctrl + D).



Print Preview

Print Preview allows you to see how each page of a specified View will print before you send it to a printer. Headers, footers, and pictures added to the Print Preview window will appear when you print the page. Pictures, legends and text stamps are not supported in the Print Preview window of the Calendar View.



To open Print Preview:

1. From the File menu, select Print Preview.

To view a different page in the Print Preview window:

1. On the Toolbar, click "Next Page"

To see the printable area of the page (to make sure items are not clipped):

1. On the Toolbar, select "Printable Area"

To zoom in and out of the view:

1. On the Toolbar, select the Zoom In or Zoom Out tool
2. Once you have zoomed in or out, use your mouse (which is now a hand cursor) to pan around the view



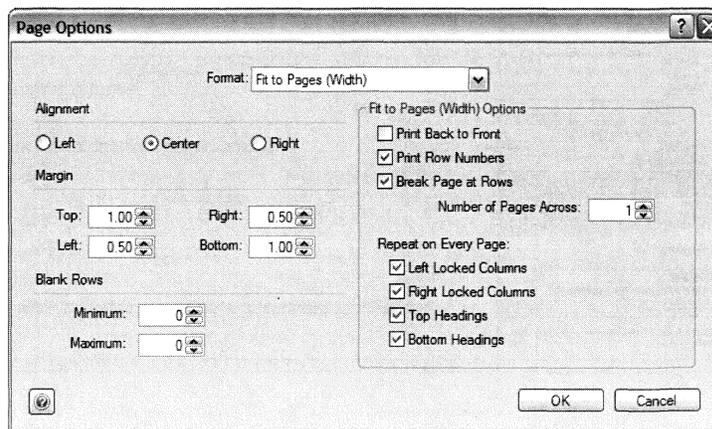
Page Options

Changing the Page Options will allow you to fine-tune the format, margins, and display of your printed schedule. There are three options available to modify a printed schedule:

Standard Format - This is the default setting, which will print the schedule on as many pages as necessary, repeating columns as appropriate.

Wall Chart (Tiled) – This option will print the schedule without repeating columns. This is useful if you will be printing to several pages across and taping them together to a poster-board or wall.

Fit to Pages (Width) – This option will adjust the timeline unit width, so your schedule is printed to a specific number of pages horizontally. You can change how many pages (horizontally) you would like to print to by changing Number of Pages Across.



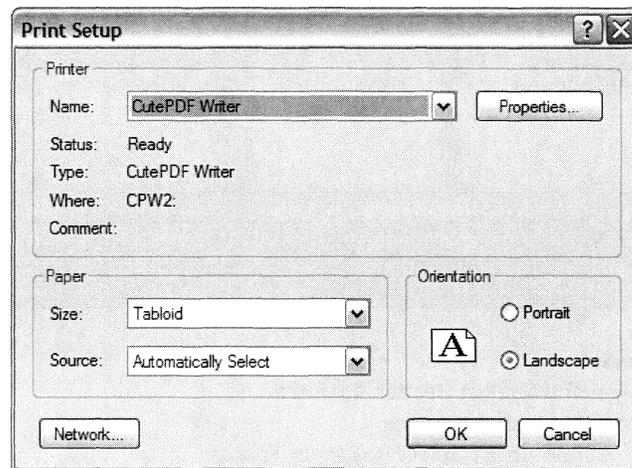
Page Options can be accessed from all views, including the Print Preview, by going to the File menu > Page Options.



Print Setup

By going to the Print Setup, the printer can be selected and properties for that printer may be modified. This dialog also allows the user to select from a list of paper sizes supported by that printer, and choose to print in portrait or landscape orientation.

To access Print Setup, go to the File menu > Print Setup.



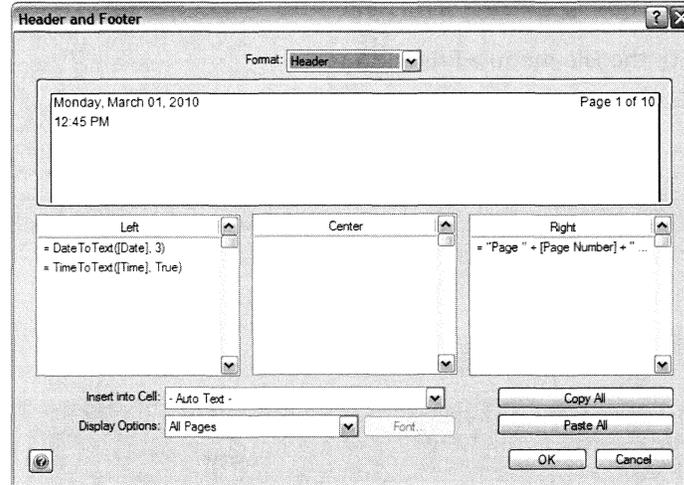
Notes:

- FastTrack Schedule looks best in Landscape orientation with Tabloid size paper (11" x 17"). These settings are recommended but not required.
- If a PDF writing software is installed on Windows, FastTrack Schedule can be printed as a PDF
- If no printer is available, FastTrack Schedule Print Setup cannot be modified because these settings are incorporated from the printer driver



Headers and Footers

Headers and footers are available when you are ready to print your schedule. This allows you to include information such as the file name, date, and page number on printed pages. It is best to set this up while in Print Preview.

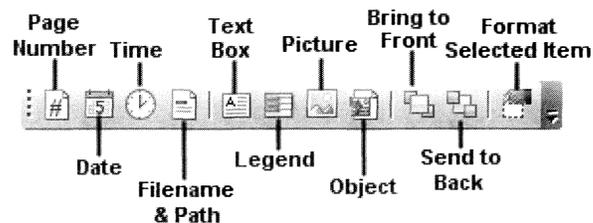


To add headers and footers:

1. Go to the View menu > select Header & Footer.
The Header and Footer dialog opens.
2. From the Format pop-up list, select Header or Footer.
3. Select a cell in the left, center, or right table into which you want to enter information.
4. From the Insert into Cell pop-up list, select one of the pre-defined pieces of data.
-or-
Enter custom information into the left, center, or right table.
5. From the Display Options pop-up list, select which pages the data will appear on.
6. If you wish, click the Font button to format the textual appearance of data in the cell.
7. Click OK to apply your font styles and close the Font dialog.
8. Click OK to apply your changes and close the Header and Footer dialog.

Adding page #, date, time, and file name stamps

Adding autotext stamps allows you to include a dynamic page number, date, time, and file name and path in the Print Preview window. This information will appear when the document is printed. You can also use headers and footers to include this data on the printed document. The following tools can be found in the Print Preview toolbar:



Stamps appear in the middle of the Print Preview window. Use the Arrow tool to drag the stamp to a different location.



Legends

Inserting Legends

Inserting a legend creates a key to the bar styles used in the schedule. It lists the chosen bar style and allows you to assign a name, or a label, to each bar style. You can create multiple legends in the Schedule View and the Print Preview windows.

To insert a legend:

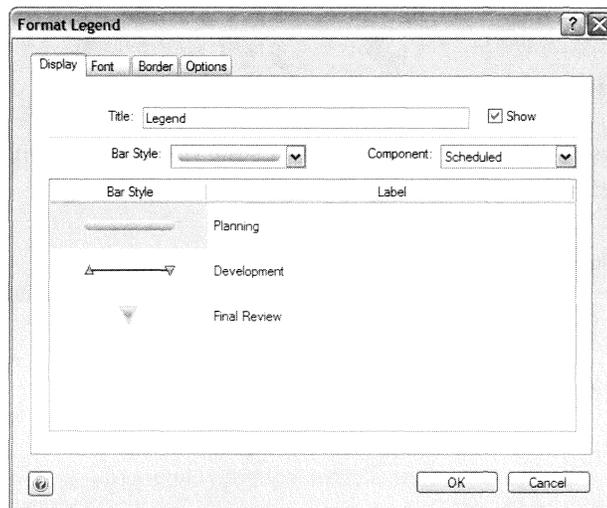
1. From the Insert menu > select Legend.
The Format Legend dialog opens.
2. Format the legend (as described in the next section).
3. Click OK to save the legend and close the Format Legend dialog.

Formatting legends

Formatting a legend defines the title, bar styles, labels, font attributes, border, background, and options for the selected legend.

To open the Format Legend dialog:

1. Using the Arrow tool, click the legend to select it.
2. From the Format menu > select Legend.
The Format Legend dialog opens.



To format a legend:

1. Click the Display tab of the Format Legend dialog.
2. Enter a name in the Title box and select the Show checkbox if you want it displayed at the top of the legend.
3. Select a cell in the Bar Style column of the table and, from the Bar Style pop-up list, select a bar style. It appears in the selected cell.
4. Select a cell in the Label column of the table and name the bar style appropriately.
5. To change the font attributes of the text or title, use the options in the Font tab.
6. To change the border or background, use the options in the Border tab.
7. Click the Options tab.
8. For Schedule View legends, in the Clipping area, select None or Containing Row.
None will display the whole legend and Containing Row will hide the parts of the legend that are outside the row that contains the legends top-left corner.
-or-
For Print Preview legends, in the Show On area, select the printed pages on which you wish to display the legend.
9. Click OK to apply your legend changes and close the Format Legend dialog.



Text Boxes

Inserting Text Boxes

Adding text boxes to the timeline allows you to enter notes, reminders, and labels that customize the appearance of your schedule.

To add a text box:

1. In the Toolbar, select the Text Box tool
2. Double-click on the text box.
3. Enter the content for the text box.



Editing Text Boxes

Editing a text box allows you to enter new text that replaces or adds to the old content.

To edit a text box:

1. Double-click on the text box.
2. Enter or edit text in the text box.

Pictures

Inserting pictures into the Schedule View timeline or Print Preview window allows you to customize your schedule with clipart, company logos, and other images.

To paste a picture:

1. Copy the picture to the Clipboard in the picture format.
2. From the Edit menu > select Paste.

To add a picture:

1. From the Insert menu > select Picture.
The Insert Picture dialog opens.
2. Select the picture from the Clipboard.
-or-
Select the File option and click the Browse button to navigate to a file.
3. Click OK to apply your changes and close the Insert Picture dialog.

Enhancing Text Boxes and Pictures

Format text boxes and pictures by adding a border, shadow, or rounding the corners.

To format a text box or picture:

1. Select the text box or picture by clicking on it
2. Go to Format > Format Selected

Notes:

As you enter text, the text box wraps the text to fit within to the width you have defined.

To add labels to individual bar elements, use the Labels tab of the Format Bar Style dialog. You can also add text boxes while in the Print Preview window. Text boxes created in the Print Preview window appear only in Print Preview and the printed schedule.



Exporting data as a picture

You can export a picture of the Schedule, Resource, and Calendar Views and/or their items to the Clipboard or a file on disk. From the Print Preview window, define what is exported: the portion of the View on the page, the View plus graphic items, or the View, its items, and an image of the piece of paper. When performed outside of the Print Preview window, an image of the entire View is exported.

In Print Preview, to export a page of the file as a picture:

1. In any View, from the File menu > select Print Preview.
2. Make sure that the page appears as you want and that nothing is selected.
3. From the File menu > select Export > choose Picture.
The Export as Picture dialog opens.
4. Select from the options described below.

This Option:	Does This:
Destination	
File	Saves the exported picture to a file on disk.
Browse	Opens a dialog where you can select a destination and file name for the export.
Clipboard	Saves the exported picture to the Clipboard.
Options	
Export Document Only	Copies the area of the file that appears on the current page.
Export Document and Paper	Copies the area of the file which appears on the current page, all text boxes and stamps in the Print Preview window on this page, and an image of the paper on which it is positioned. This also includes headers, footers, and pictures.
Export Document and Page Items	Copies the area of the file which appears on the current page plus all text boxes and stamps in the Print Preview window on this page. This also includes headers, footers, and pictures.

5. Click OK to create the export and close the Export as Picture dialog.

In the Schedule, Resource, or Calendar Views, to export the entire View as a picture:

1. Make sure nothing is selected.
Click once in the blank timeline area or outside of the calendar to assure this.
2. From the File menu > select Export > choose Picture.



Exporting data as an iCalendar file

You can export your open schedule as an iCalendar (.ics) file. Only activities that are currently displayed will be exported. If the schedule has a filter applied, only those activities will be exported to the .ics file.

To export an iCalendar file

1. From the File menu > select Export > iCalendar.
The Export iCalendar dialog opens.
2. Click Export.
The Save As dialog opens.
3. Choose the name and location in which to save the exported .ics file.
4. Click Save to close the Save As dialog and export your open schedule data to an iCalendar file.

Column data which are exported: Activity Name, Notes, Location, Attendees, Duration, Start Date, Start Time, Finish Date and Finish Time. These columns are combined in a predefined layout – iCalendar Layout.

Exporting data as MPX/XML

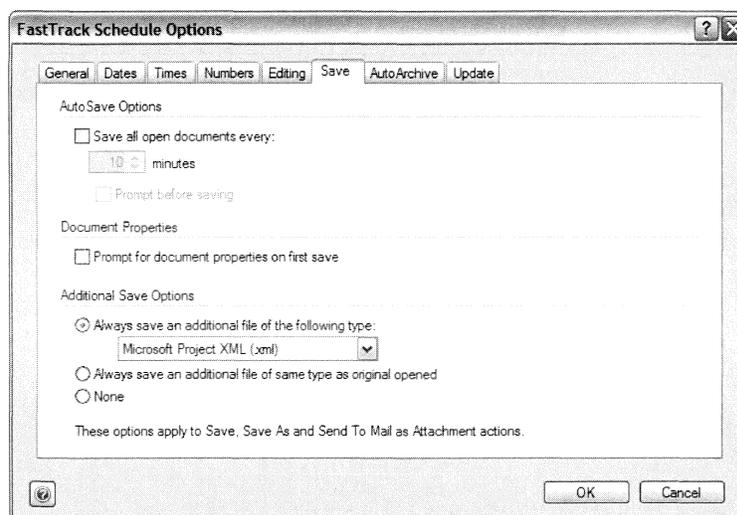
To see FastTrack Schedule data in other project management applications, you can select the options of exporting as MPX or XML file formats. MPX and XML are file format standards for project management applications. Data that is stored include the project outline, progress tracking, custom columns and resource assignments. Formatting of fonts and bar styles are not converted, since the other applications may not support FastTrackSchedule’s formatting abilities.

To export an MPX or XML file

1. From the File menu > select Export > MPX or XML
2. Click Export. The Save As dialog opens.
3. Choose the name and location in which to save the exported .mpx/.xml file.
4. Click Save to close the Save As dialog and export your schedule.

Additional Save Options

Automate an export of your schedule in XML, MPX or ICS formats upon every save of your FastTrack Schedule file. Go to Tools > Application Options to apply this setting.





Formatting the Calendar View

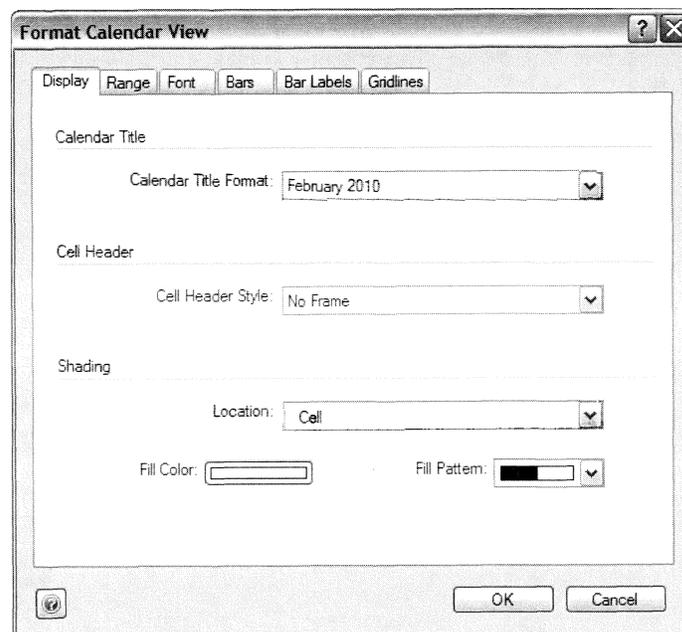
The Calendar View displays information from the Schedule View in the traditional look of a wall calendar. This allows you to view time vertically rather than horizontally. You can view and print completely customizable calendars that can be filtered to display only those activities you want to see.

In the Calendar View, you can draw bars; move bars; hide bars; filter activities – to view only those bars you want to see; edit Scheduled, Revised and Actual dates and times; apply Ranges and FastSteps; and print the calendar in current, monthly, and custom configurations.

Each display element of the calendar can be customized in the Format Calendar View dialog.

To format the display of the Calendar View:

1. In the Calendar View, from the Format menu > select View.
2. Click the Display, Range, Font, Bars, Bar Labels or Gridlines tab to format the appearance of that element of the calendar.
3. Click OK to apply your changes and close the Format Calendar View dialog.





MODULE 9

Advanced Features Introduction



Module 9

Advanced Features Introduction

Overview: This module reviews the Essentials of FastTrack Schedule and introduces advanced ways of beginning a new schedule.

- a. Recap of FastTrack Schedule
- b. Schedule View Information Form



Application Overview

FastTrack Schedule is a project management application for tracking all your projects, activities, tasks, resources, to-do lists, and deadlines.

FastTrack Schedule helps you organize, track, and manage your projects by graphically representing start and finish dates as bars along a timeline graph. Within project management, this type of schedule is known as a Gantt chart named after its creator, Henry Gantt.

FastTrack Schedule automates the Gantt chart, making it a dynamic timeline. In addition to extensive graphic capabilities and customizable features, it is also a powerful database. As you draw, resize, and move bars along the timeline graph, it automatically updates start and finish dates, durations, dependencies, percent complete values, and costs.

To enter an activity you can draw a bar directly on the timeline graph and have FastTrack Schedule enter the duration and dates for you, or you can enter the duration or the dates in columns and have FastTrack Schedule draw the bar for you.

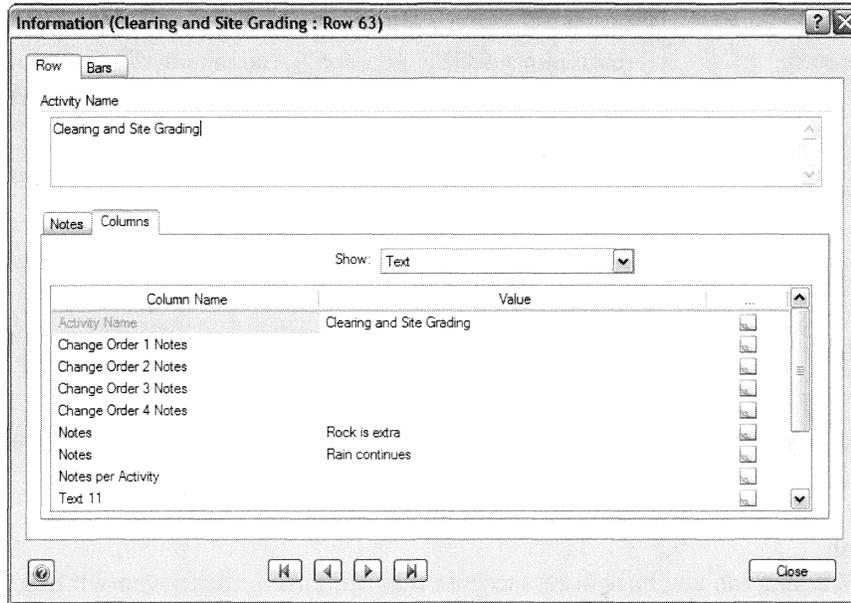
In fact, everything you can do to an activity bar, can be done with your mouse and the tools in FastTrack Schedule's Toolbars or by editing values in columns. This flexibility allows you to concentrate on the activities you are scheduling, instead of the act of scheduling those activities.



Schedule View Information Form

Row tab

Two sub tabs are available in the Row tab, Notes and Columns. In the Row tab > Columns tab you have access to data for all of the columns, relating to a particular activity, which store data per row rather than per bar. In the Row tab > Notes tab you have a place to store notes relating to each Activity.



To enter data in the Row tab:

1. Click in a row's Information Form action column.
The Information form opens in the Row tab.
2. Enter or edit data using the options described below.

This option:	Does this:
Activity Name window	Displays the name of the activity whose data is currently being shown in the form. Enter and edit the activity name from this window.
Show	Allows you to select which custom columns will display.
Column Name	Displays the names of any columns whose data is stored per row.
Column Value	Displays the values of any columns whose data is stored per row. If you have defined a value list for a column, that value list will appear when you click in the Value cell.

3. Click OK to apply your changes and close the Information form.



Bars tab

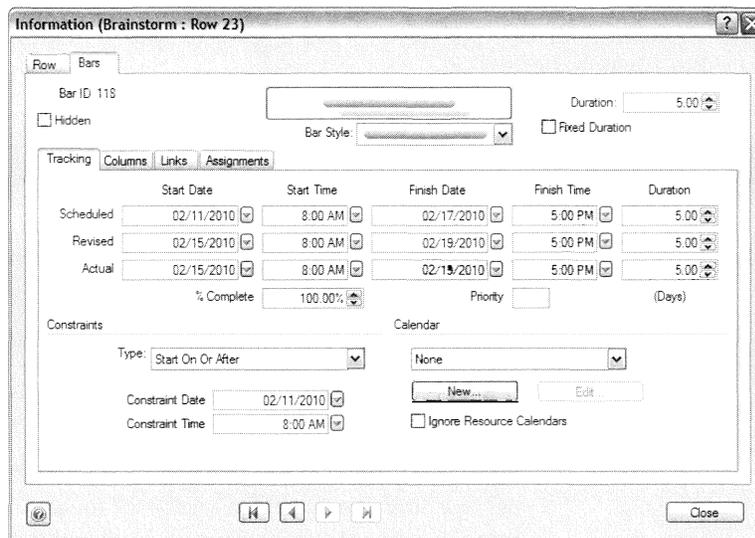
In the Bars tab of the Information form, you can view and edit the following data:

This option:	Does this:
Bar ID	Displays the Bar ID of the bar whose information form you are viewing.
Bar X of X	When there is more than one activity bar or milestone in a row, the number of that bar in relation to all the bars in that row is displayed (e.g. Bar: 1 of 7). You can use the arrow keys beside the Bar display window to navigate to other bars in the row.
Bar window	Displays the bar whose data is currently being shown in the Bars tab.
Bar Style	Allows you to change the current bar's bar style by selecting a new one from the list.
Hidden	Manually hides the bar on the timeline graph and its data in the columns.

The Bars tab of the Information form has four additional tabs – Tracking, Columns, Links, and Assignments.

Bars > Tracking tab

In the Bars tab > Tracking tab you have access to data that pertains to the movement of a bar, within a particular activity.



To enter data in the Bars > Tracking tab of the Information form:

1. Double-click on an activity bar (on the timeline graph).
The Information form for that bar opens in the Bars > Tracking tab.
2. Enter or edit data using the options described in the next page.

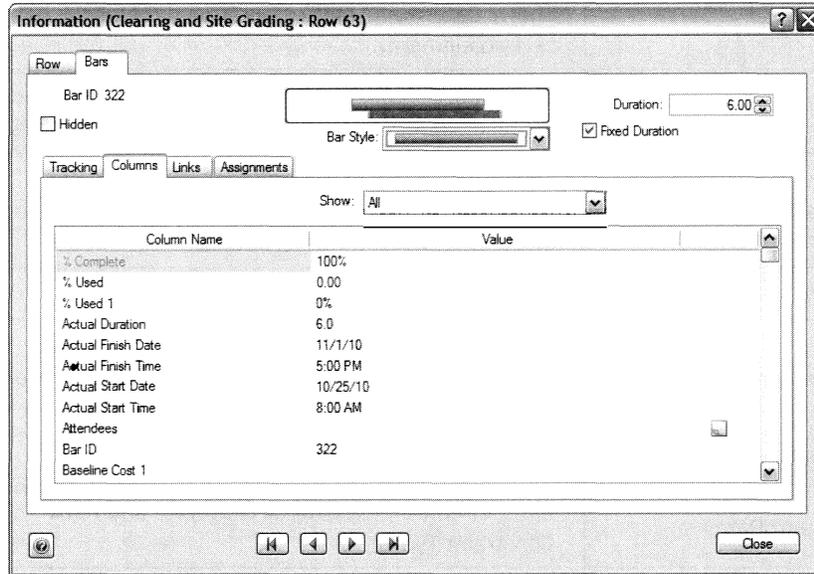


This option:	Does this:
Scheduled Boxes	Shows Date, Time, and/or Duration data for the bar's scheduled element.
Revised Boxes	Shows Date, Time, and/or Duration data for the bar's revised element.
Actual Boxes	Shows Date, Time, and/or Duration data for the bar's actual element. Actual data reflects the % complete.
% Complete	Shows how much of the task represented by the particular bar has been completed. The % complete affects the Actual Dates and Times.
Priority	Indicates the bar's assigned priority.
% Complete	Shows how much of the task represented by the particular bar has been completed. The % complete affects the Actual Dates and Times.
Constraints & Calendar	
Constraint Date	Enter or edit the date for all Moderate and Hard Constraint Types.
Constraint Time	Enter or edit the time for all Moderate and Hard Constraint Types.
Constraint Type	Choose the Constraint that best suits the behavior you would like the activity bar to exhibit.
Calendar	Choose the calendar which the task should be scheduled on. Anything different from the project calendar will be indicated in the Information Form action column.
Ignore Resource Calendars	When resources are assigned to an activity, you can choose to ignore resource calendars which could shift when tasks are scheduled to occur.



Bars > Columns tab

In the Bars tab > Columns tab you have access to data for all of the columns, relating to a particular activity, which store data per bar rather than per row.



To enter data in the Bars > Columns tab of the Information form:

1. Double-click on an activity bar (on the timeline graph).
2. Click on the Columns tab.
3. Enter or edit data using the options described below.

This option:	Does this:
Show	Allows you to choose which type of columns to display in the table, e.g. All columns, Calculation columns only, Date columns only.
Name	Displays the names of any columns you have created whose data is stored per bar.
Value	Displays the values of any columns you have created whose data is stored per bar. If you have defined a value list for a column, that value list will appear when you click in the Value cell.

4. Click OK to apply your changes and close the Information form.

Notes:

Remember that the activity name and row number is displayed in the dialog's title bar reflecting only the activities currently displayed in the schedule. Any collapsed or hidden activities will have to be restored before you can view their Information form.

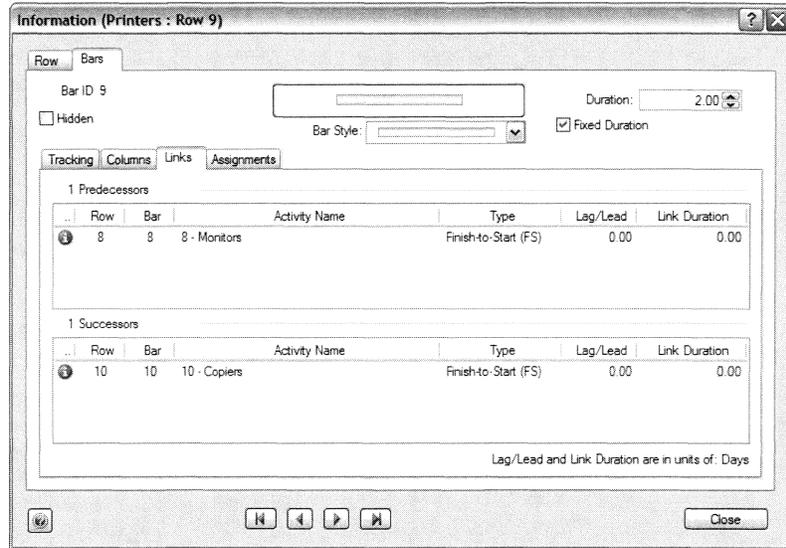


Bars > Links tab

In the Bars tab > Links tab, you have access to all the information about an activity bar’s links (dependencies). You view the information in terms of links to predecessor and successor bars.

To enter data in the Bars tab > Links tab of the Information form:

1. Double-click on an activity bar.
2. Click the Bars > Links tab.
3. Enter or edit the link data in the Predecessors and Successors tables.
4. Click OK to apply your changes and close the Information form.

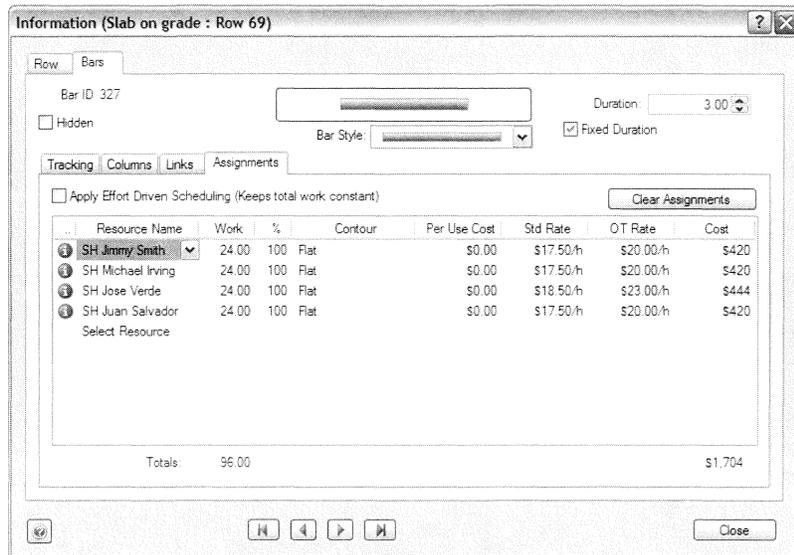


Bars > Assignments tab

In the Bars > Assignments tab you have access to all the information about an activity bar’s assigned resources.

To enter data in the Bars > Assignments tab of the Information form:

1. Double-click on an activity bar.
2. Click the Bars > Assignments tab.
3. Enter or edit the resources assigned to the activity.
4. Click OK to apply your changes and close the Information form.





MODULE 10
Resources



Module 10

Resources

Overview: This module will teach you how to create, assign, and manage resources using the Resource and Schedule Views.

- a. Understanding the Resource View
- b. Creating Resources
- c. Resource Information Form
- d. Effort Driven and Fixed Duration
- e. Assigning Resources
- f. Managing Resources
- g. Resource Allocation
- h. Resource Work Usage Graph
- i. Resource View Filters
- j. Tracking Resource Costs



Understanding the Resource View

The Resource View is similar to the Schedule View because it has columns, rows, a timeline graph, reporting functions, and an information form. It is different, however, because instead of tracking and managing activities, this view is for tracking and managing resources.

Tracking who or what is responsible for completing the tasks you are scheduling is one of the most important parts of managing a project. Resources are any material, equipment, or human resources that help you accomplish the tasks in your schedule.

Every resource has a finite amount of time it can be used and effort it can exert. Every resource can also have a cost attached to it whether it is a flat fee, a standard rate, an overtime rate, or any combination thereof. Each of these elements can be automatically charted and controlled in the Resource View of FastTrack Schedule.

There are 3 steps in successful resource management: 1) Create, 2) Assign, and 3) Manage.

Creating Resources

First Step

A resource can be created in either the Schedule View or the Resource View. While in the Schedule View, typing in the Resources Assigned column will automatically create resources in the Resource View. Although this can be done, it is recommended that you create each resource in the Resource View so that a work calendar and rates can be established at the time of creation.

In the Resource View, a resource can be created by typing a name in the Resource Name column. The Resource View provides a unique work calendar for each resource, allowing you to setup the hours of the day for typical and specific days. The resource work calendar is defined in the Resource Information form.

Resources can be created using the Resource Information form.

To setup a new resource:

1. Begin by typing the name of your resource in the Resource Name column.
2. Click in the Information Action column intersecting the resource name to setup.
3. You can then enter, Type, Per Use Cost, Standard Rate, and Overtime Rate, etc.
4. Click the Work Calendar tab to define the work days and hours of this resource.
5. Click OK to apply your changes and close the Resource Information form.



Resource Information Form

Information Tab

Use the Resource Information form to enter and edit resource information. Though you can enter data directly into the columns of the Resource View, you may not want to display every column. The Resource Information form gives you immediate access to every resource column, hidden or shown.

The screenshot shows a software window titled "Resource Information (Mary Johnson : Row 1)". It has three tabs: "Information", "Work Calendar", and "Other Columns". The "Information" tab is active. The form contains the following fields and sections:

- Resource Name:** Mary Johnson
- Type:** In-house Personnel
- Per Use Cost:** \$50.00/h
- Standard Rate:** \$50.00/h
- Overtime Rate:** \$75.00/h
- Initials:** MJ
- Code:** [empty]
- Group:** [empty]
- Resource Notes:** Best to call Mobile on Fridays, Saturdays and Sundays
- Full Name:** Mary Johnson
- Job Title:** Project Manager
- Employee ID:** [empty]
- Company:** [empty]
- Department:** Company Events
- Material Label:** [empty]
- Addresses:** Business (1234 Company Way, Sterling VA 20166, USA) and Home [empty]
- Phone Numbers:** Main, Business (703) 444-5555, Business Fax (703) 111-2222, Home, Home Fax, Mobile (703) 987-5543, Mobile 2 [empty]
- Internet:** E-mail (mj@company.com), E-mail 2 [empty], Business URL, Home URL, IM Address, IM Address 2 [empty]

In this box:	Do this:
Resource Name	Enter a name for the resource. It is a good idea to be as specific as possible, because no two resources can have the same name. For example, typing "Mike" instead of "Mike Stuart" could lead to trouble if another Mike works on the project.
Type	Enter a descriptive word to categorize the resource. For example, you might just enter "Human," if it is a person, or you may want to be more specific and enter something like "Software Developer." This value is for your reference only and does not affect the data in any way. Think about how you would like to use Type information in filters and sorts.
Per Use Cost	Enter a dollar amount that is charged every time this resource is assigned to a task. Think of this as a flat fee paid to use this resource. If this resource is assigned to several tasks in the project, the dollar amount you enter here will be factored into the Total Cost of each task.
Standard Rate	Enter a dollar amount that is calculated per hour, day, week, month, quarter, or year in relation to the task's duration. The default rate is per hour.
Overtime Rate	Enter a dollar amount that is calculated per hour, day, week, month, quarter, or year when the resource works overtime. Entering a "0" means the resource will receive NO overtime pay; leaving this blank means the resource's Overtime Rate is equal to the Standard Rate.



Work Calendar Tab

Defining the work calendar allows you to setup the hours of the day for typical and specific days. The resource work calendar can be defined in the Resource Information form.

Resource Information (Mary : Row 2)

Information Work Calendar Other Columns

Base Calendar: Standard (Project Calendar) [v] [Copy Calendar] [Paste Calendar]

Define Specific Days November 2010

Sun	Mon	Tues	Wed	Thur	Fri	Sat
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
	0.00	0.00	0.00	0.00	0.00	
28	29	30	1	2	3	4
5	6	7	8	9	10	11

Exceptions

Date	Description
11/22/10	Vacation
11/23/10	Vacation
11/24/10	Vacation

[Create Exception] [Delete Exception]

Work Shift Details

Start	Finish	Total
-------	--------	-------

Define Typical Week Days

Sun	Mon	Tues	Wed	Thur	Fri	Sat
0.00	8.00	8.00	8.00	8.00	8.00	0.00

Legend

Typical Base Calendar Exception
Non Working Resource Exception

Use typical work day shifts on base calendar

[Copy Day] [Paste Day] [Clear Day]

[Close]

To create or edit a resource work calendar:

1. In the resource information form, select the Work Calendar tab.
2. Define the Work Calendar with the options described below.
3. Click OK to apply your changes and close the Resource Information form.

Base Calendar

Base Calendar defaults to the calendar that the project is using (defined in Project Information). Other defined calendars can be used as base calendars as well. When changes are made to the calendar that is being used as a base calendar, all resource calendars using it as a base calendar are updated with the changes. Exemptions to resource calendars are applied only to the resource.

To set the work hours for the Typical day of the week (such as Mondays, if different from the base calendar):

1. In the Define Typical Week Days area, click on the day of the week for which you want to define typical hours.
2. Under the Work Shift Details table, deselect "Use typical work day shifts on base calendar"
3. In the Work Shift Details table, select the Start and Finish times for desired work shifts. The total number of work hours appears under that day in the Define Typical Week Days area.
4. Repeat this procedure for every day you wish to set.

Notes:

The Copy Day button copies the work shift details for a typical or specific day to the Clipboard. The Paste Day button pastes work shift details from the Clipboard to a typical or specific day. The Copy Calendar button copies the contents of the work calendar to the Clipboard. The Paste Calendar button pastes a work calendar from the Clipboard to a new schedule.



To set the work hours for a Specific day (different from the base calendar's):

1. In the Define Specific Days area, select a month and year to display from the pop-up lists. The month appears in the calendar below.
2. Select a day from the calendar.
3. Under the Work Shift Details table, deselect "Use typical work day shifts on base calendar".
4. In the Work Shift Details table, select the Start and Finish times for desired work shifts. The total number of work hours appears on the day.
5. You may enter in a Description of the exception under Exceptions.

To set a Specific day as a Non-Work Day:

1. In the Define Specific Days area, select a month and year to display from the pop-up lists. The month appears in the calendar below.
2. Select a day from the calendar.
3. Select the Clear Day button to remove all work hours from the day. The total work hours for that specific day appear in the calendar.
4. You may enter in a Description of the exception under Exceptions.

Effort-Driven & Fixed-Duration

Before assigning resources to activities, first determine if the activity is an effort-driven or a fixed-duration activity. Defining this information about the activities helps the application allocate the appropriate amount of work and time needed for an activity's completion as resources are assigned.

Effort-Driven

An effort-driven activity's amount of work (man hours) needed to complete the activity remains constant. The elapsed time (duration) will adjust accordingly.

For example, the activity to set up a booth is an effort-driven activity. If booth setup requires 8 man hours, it would take one resource 8 hours to complete. Based on effort-driven scheduling, adding another resource doubles the amount of effort to setup the booth, which would then cut down the duration of the activity by half while keeping the amount of work the same.

Going the other direction, if one resource exerts half as much effort to set up the booth, it would take them an elapsed time of 16 hours to complete the activity.

Fixed-Duration

A fixed-duration activity's elapsed time to complete the activity remains constant. Changing the resource effort will not adjust the activity's duration.

For example, the activity to run the booth at a tradeshow is a fixed-duration activity. Say the tradeshow is scheduled for three days. No matter how many resources are assigned to man the booth, the tradeshow's elapsed time will remain the same.

						June 2010					
						Friday	Saturday	Sunday	Monday		
						25	26	27	28		
1	▼ Tradeshow										
2	Booth structure setup	1.00	Charlie, Dave	Yes	No						
3	Computer setup	2.00	Linda[50%]	Yes	No						
4	▼ Booth AM Shift										
5	Day 1	1.00	Charlie[50%], Dave[50%]	No	Yes						

Activities can be defined as Effort-Driven or Fixed-Duration by inserting the corresponding columns or by opening the Activity Information Form > Assignments tab.



Assigning Resources

Second Step

Go to the Schedule View to Assign Resources to specific activities. Assignments link a resource and all its data to a task or tasks in the schedule. The Schedule and Resource Views draw from two different pools of information. Assignments act to bridge those two pools of information.

You can create a schedule full of tasks and you can create numerous resources complete with work calendars and cost data, but until you actually assign a resource to a task, the Schedule and Resource Views cannot interact.

Resources Assigned Column

If the name of the resource is the only detail that needs to be tracked for each assignment, type the Resource Name directly into the Resources Assigned column to create the assignment.

To assign a resource to a bar:

1. In the Schedule View, click in the specified activity's Resource Assigned column.
2. Type the Resource name or select from a pop-up list if one has been created.

Schedule View Information Form > Assignments tab

If details of each resource need to be modified, it is recommended that the assignments be made through the Information form.

To assign a resource to a bar:

1. In the Schedule View, click in a row's Information Form action column.

-or-

In the Schedule View, double-click on the bar or milestone that represents the task to which you want to assign a resource.

The Information form opens in the Tracking tab.

2. Select the Assignments tab.
3. Select the Select Resource pop-up list in the Resource Name column of the Assignments table.

Resource Name	Work	%	Contour	Per Use Cost	Std Rate	OT Rate	Cost	
Mary	40.00	100	Flat	\$50.00			\$50.00	
Totals:							40.00	\$50.00



From the list, you can choose Create Resource to open the Resource Information dialog and create a new resource or you can select from a list of already created resources.

Each cell in the Assignments table is described below:

In this box:	Do this:
	Click the icon to open the Resource Information form for the resource selected in the Resource Name pop-up list. You can scroll through the various resources assigned for each task.
Resource Name	Select a resource from a pop-up list containing every defined resource that is not already assigned to this task. Or select Create Resource to define a new resource you want to assign to the bar.
Work	Amount of work required to complete the activity.
% Effort	Enter or edit the percentage of the resource's time you want devoted to the specific task.
Contour	Select the applicable effort distribution for the activity.
Per Use Cost	Enter or edit the dollar amount that will be charged every time this resource is assigned to this particular task. This is a flat fee paid to use this resource. If this resource is assigned to several tasks in the project, it can have different Per Use Costs in every assignment.
Standard Rate	Enter or edit a dollar amount that will be calculated per hour, day, week, month, quarter, or year in relation to the task's duration. The default rate is per hour. Enter "\$150.00/d" for the Rate Per Day, "\$150.00/w" for the Rate Per Week, etc.
Overtime Rate	Enter or edit a dollar amount that will be calculated per hour, day, week, month, quarter, or year when the resource works overtime. A "0" in this cell means the resource will receive NO overtime pay. This cell blank means the resource's Overtime Rate is equal to its Standard Rate. The default time period is Rate Per Hour.
Cost	View the assignment Cost, where $Cost = (Per\ Use\ Cost) + (Standard\ Rate * Work) + (Overtime\ Rate * Overtime\ Work)$

When resources are assigned to activities, the activities take into account the resource's work calendar. The resource's work calendar (availability) takes precedence over the project calendar. If a resource is not available (custom non-work days defined), FastTrack Schedule 10 will shift the activity to when they are available. You have the ability to ignore resource work calendars.

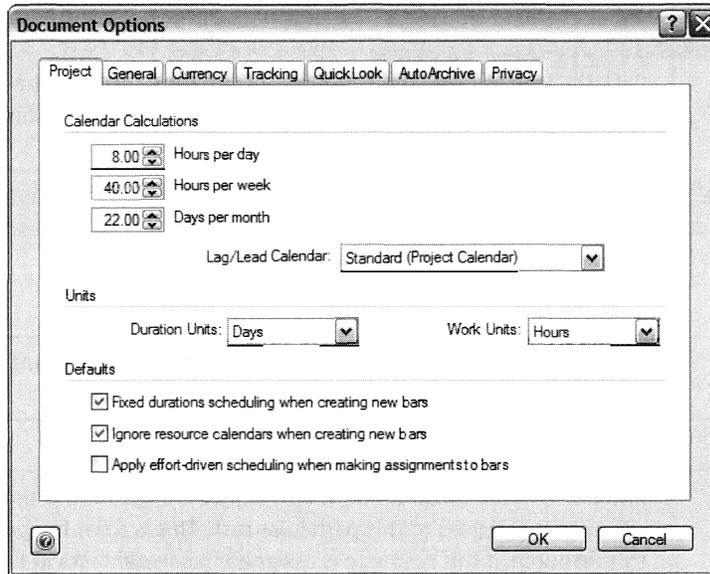
To ignore resource work calendars when assigning resources:

1. Double-click on the activity bar (on the timeline graph)
2. In the Information Form's Tracking tab, select 'Ignore Resource Calendars'



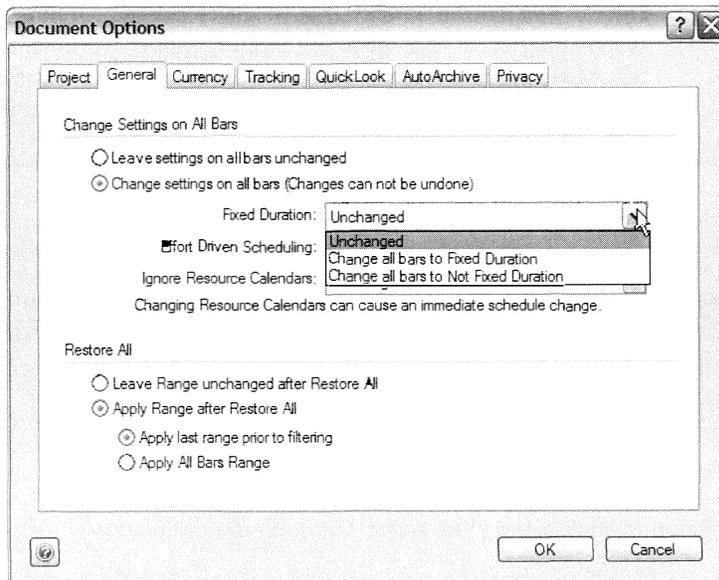
Document Options

There are some document options that have to do with defaults regarding whether activities should be effort-driven, fixed-duration, or if resource calendars should be ignored upon creation of new bars. You can access these options by going to Tools > Document Options > Project tab.



By default, new schedules will create activities that are effort-driven as well as taking into account resource calendars as resources are assigned.

You can also apply universal settings to existing activities by going to Document Options > General tab.





Managing Resources

Third Step

The third step to remember, and probably the most important to the success of a project, is managing your resources. Managing Resources should be done on a continuous basis while creating and assigning resources to avoid over allocation and other conflicts.

What do you do when a Resource is over allocated?

Here are some questions to ask yourself when you find you have over allocated a resource.

1. Can these tasks be completed as scheduled?

If the tasks can be completed as scheduled then no changes need to be made in the Resource View. If they cannot be completed as scheduled then continue on with the next question.

2. Do the tasks have to happen on these days?

If the tasks do not need to happen on the scheduled days, the scheduled bars can be adjusted to even the load of the responsible resource by dragging the bar to the left or the right. Any changes made in the resource view will be reflected in the Schedule View. Bars that are linked in the schedule view will affect dependencies. If the tasks have to happen on the scheduled day, move to the next question.

3. Are the durations per day correct?

If the activity durations are not correct, each task can either be *spot allocated* or the *percent effort* of a task can be decreased. If the activity durations for each day are correct then move to the next question.

4. Is the resource assigned the only viable resource?

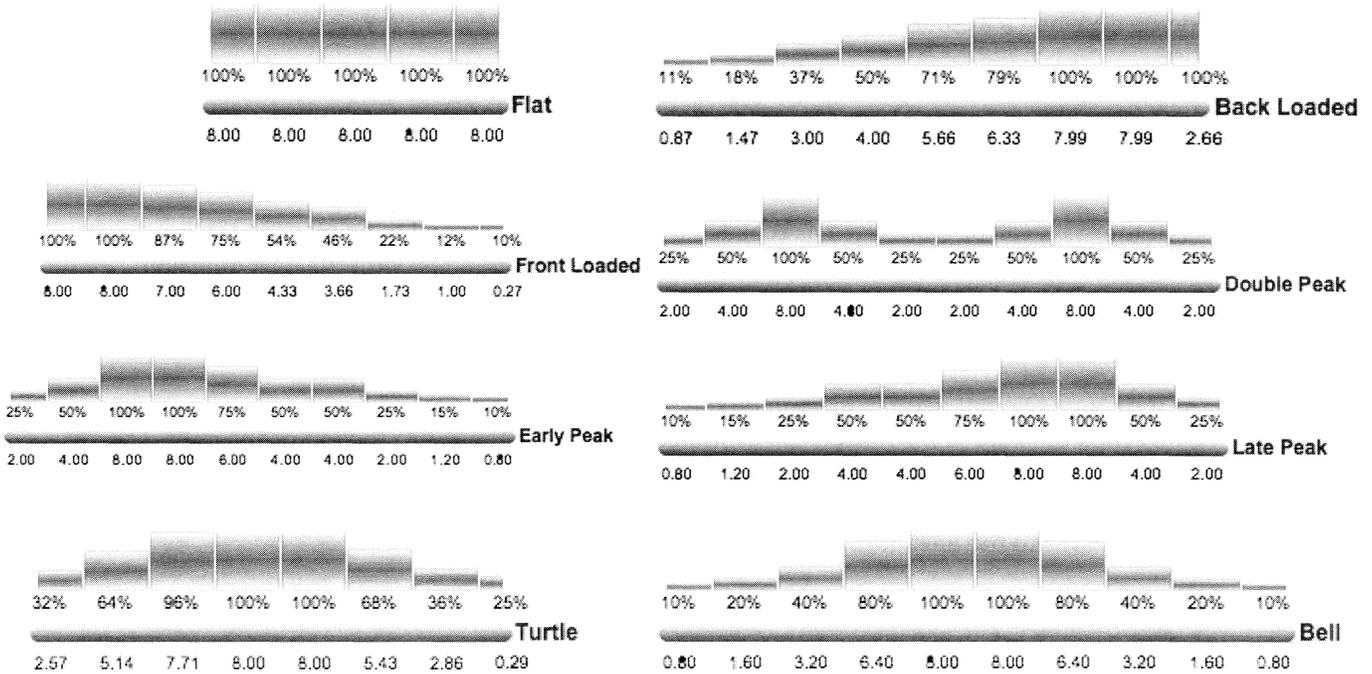
If an alternate resource can be assigned to take the load off of the over allocated resource, this can be done by reassigning the resources. If an alternate resource cannot be substituted, you may want to seek additional resources.



Resource Allocation

Contours

There are pre-defined contours within the Information Form > Assignments tab. They can be applied to distribute the amount of effort the assigned resource exerts over the duration of the activity.



Custom Contour / Spot Allocation

Spot allocation is the act of editing a portion of an assigned resource’s total work (i.e. Hourly, Daily, etc.) in the Assignments subrow of the Resource View. Spot allocation is based on the Resource View timeline units as you have currently defined them (i.e. Work Hours, Work Days, etc.).

Resource Name	Sun	Mon	Tues	Wed	Thur	Fri
Ann Parker	14	15	16	17	18	19
Percent Work Usage	0%	100%	100%	200%	100%	100%
Hourly Work Usage	0.00 h	8.00 h	8.00 h	16.00 h	8.00 h	8.00 h
Research						
Design		8.00	8.00	8.00		
Prototype				8.00	8.00	8.00

Resource Name	Sun	Mon	Tues	Wed	Thur	Fri
Ann Parker	14	15	16	17	18	19
Percent Work Usage	0%	100%	100%	100%	100%	100%
Hourly Work Usage	0.00 h	8.00 h				
Research						
Design		8.00	8.00	4.00		
Prototype				4.00	8.00	8.00

Percent Effort

When you use Percent Effort values, anything over 100% effort is overtime. You enter and edit the Percent Effort a resource will expend on a particular task in the Bars > Assignments tab of the Information form. When the percent effort is modified, the value is applied to the entire duration of the task.



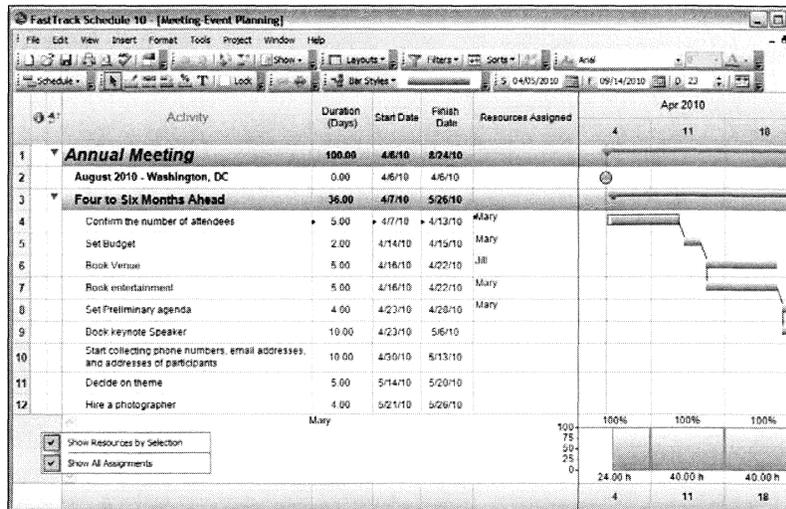
Resource Work Usage Graph

While in the Schedule View, you can also get a peek of resource utilization by viewing the Percent Work Usage graph. It aids in assigning of resources as well as reporting of resource availability. To display, go to View > Percent Work Usage.

By default, the graph will show resources assigned to the selected activity along with all of their other assignments.

To change the Percent Work Usage graph to display only the selected activity's resource allocation:

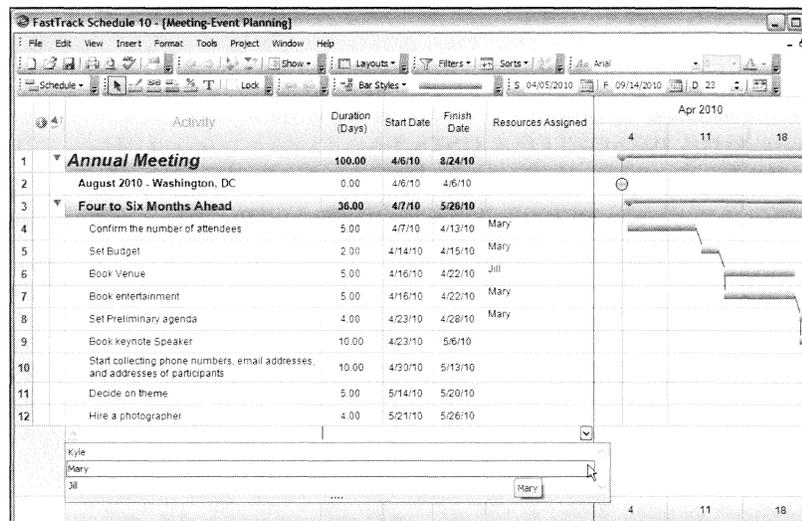
1. Right-click in the blank area to the left of the resource name (see right image)
2. Deselect 'Show All Assignments'



Another way of viewing the Percent Work Usage graph is to select the desired resource and have all of their allocations displayed. Using the graph in this way will allow the user to easily see their desired resource's current assignments.

To change the Percent Work Usage graph to display only the selected resource's allocation:

1. Right-click in the blank area to the left of the resource name (see above right image)
2. Deselect 'Show Resources by Selection'
3. Click in the Resource Name area and select desired resource from value list.





Resource View Filters

In the Resource View, Column/Value criteria filters can also be defined in the same way as in the Schedule View. Since the Resource View's focus is on resource allocation and assignments, Assignment Criteria filters can also be defined. For example, maybe when it comes time to assign resources for the next month, you may want to see which resources are assigned comfortably so that they can be assigned to more activities.

The screenshot shows the 'Define Filter' dialog box with the following details:

- Filter Name:** Resources Assigned Comfortably Next Month
- Options:** Column/Value Criteria, Assignment Criteria (selected)
- Assignment:**
 - Resource Not Assigned
 - Resource Assigned Comfortable (0-59%)
 - Resource Assigned At Full Normal Capacity (100%)
 - Resource Over Assigned (> 100%)
- Check Assignment across Date/Time Range:** Next Month (dropdown)
- From (Start):** Start Date, Start Time
- To (Finish):** Finish Date, Finish Time
- Buttons:** OK, Cancel

To define an Assignment Criteria filter:

1. In the Resource View, go to Project > Filters > Define.
2. Select the Assignment Criteria tab.
3. Select the desired Assignment percentage and if appropriate, a specified Date/Time Range.
4. Select OK to save the filter. Select OK to apply the filter.

Tracking Resource Costs

Resource costs can be tracked in both the Resource View and the Schedule View using columns, calculations, and summary graphs.

Schedule View

In the Schedule View, go to the Cost Layout. Here you will find a Fixed Cost column, a Resource Cost column, and a Total Cost column. The values in the Resource Cost column are derived from the Standard Rate, Overtime Rate, and Fixed Costs that were defined for each resource when it was created and assigned. The Resource Cost per Month summary graph is a per month calculation derived from the Resource Cost column.

Resource View

In the Resource View go the Total Resource Cost Layout. Here you will find the Total Resource Cost column and the Total Assigned Units column. The Total Assigned Units column is the sum of all the hours of work to which the resource has been assigned. Total Resource Cost is the sum of all the costs for each assignment.



MODULE 11

Work Calendars



Module 11

Work Calendars

Overview: This module will teach you how to create the different types of work calendars and their use.

- a. Defining Calendars
- b. Using Calendars



Defining Calendars

An unlimited number of work calendars can be created. Work Calendars can be applied as the project calendar, resource calendar, base calendar, task calendar and link calendar. All calendars can be modified by going to Project menu > Work Calendars.

The 'Work Calendars' dialog box contains the following elements:

- Calendar:** Standard (Project Calendar)
- Base Calendar:** Standard (Project Calendar)
- Define Specific Days:** A calendar grid showing days from 20 to 10. Monday (8) is highlighted.
- Define Typical Week Days:**

Sun	Mon	Tues	Wed	Thur	Fri	Sat
0.00	8.00	8.00	8.00	8.00	8.00	0.00
- Legend:**
 - Typical (white box)
 - Base Calendar Exception (light gray box)
 - Non Working (light blue box)
 - Resource Exception (dark gray box)
- Exceptions:** A table with columns 'Date' and 'Description'.
- Work Shift Details:**

Start	Finish	Total
8:00 AM	12:00 PM	4.00
1:00 PM	5:00 PM	4.00

The **project calendar** is discussed in Module 2: Top Down Planning.

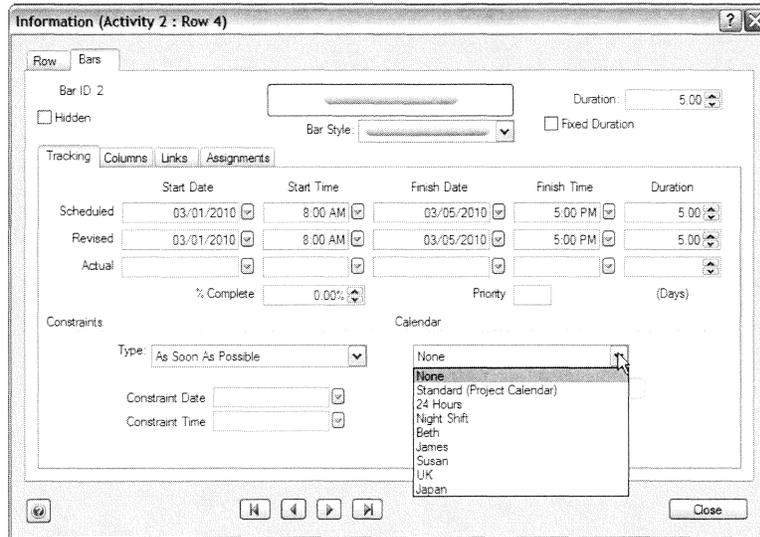
The **resource** and **base calendars** are discussed in Module 10: Resources.

Using Calendars

Task calendars can be applied per activity. On occasion, a task may be on a calendar different from the project calendar, not assigned to a resource, or simply goes by a different schedule. When an activity has a task calendar applied, different from the project calendar, a calendar icon  will appear in the activity's Information Form. Task Calendars take priority over resource calendars.

To Apply a Task Calendar:

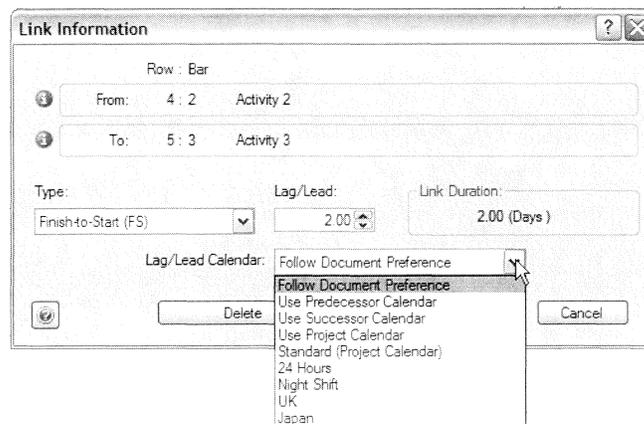
1. Double-click on the activity bar (on the timeline graph)
2. In the Information Form, select an available calendar from the Calendar list or click 'New' to create a new one



Link calendars can be applied in the Link Information dialog. Link calendars are actually applied to calculate lag time within the link. It's possible that the predecessor and successor activities have different task calendars applied, on top of a different project calendar. Being able to define which calendar lag should be based on gives you all of these options.

To apply a Link Calendar to an individual link:

1. Double-click on a defined link (on the timeline graph)
2. In the Link Information dialog, select the desired Lag Calendar using the available work calendars.



“Follow Document Preference” can be found in Tools menu > Document Options > Lag Calendar. This is where the default lag calendar is defined.



MODULE 12
Calculations



Module 12

Calculations

Overview: This module will teach you how to create and use customizable calculation columns.

- a. Calculation Columns
- b. Calculation Elements
- c. Defining a Calculation



Calculation Columns

A calculation can consist of any viable combination of column references, text strings, numbers, functions, and operators. For example, the following calculation could be used to return a value for a calculation column you name "Variance" if you assume you want to know the variance of your budget and cost.

$$[\text{Budget}] - [\text{Total Cost}]$$

In this example, the Total Cost and Budget columns are numeric. Each time values are assigned to the Total Cost column, FastTrack Schedule subtracts that value from the Budget column and displays the result in a calculation column you have named "Variance".

The result of a calculation is referred to as the return value. All of the values required as input to the calculation must be present to evaluate the calculation. If one of the values required for the calculation does not exist when the calculation is evaluated, FastTrack Schedule does not assign a value to the calculation. The value of the calculation column is empty (null) until the missing value is supplied.

Calculation Elements

A calculation can contain the following elements:

Type of element:	Example:
Column reference	[Total Cost]
Text String	"Over Budget"
Number	100
Functions	If(Cond, Result1, Result2)
Combination of elements	If([Budget] - [Total Cost] < 0, "Over Budget!", "")

These elements can be combined using Operators to produce an expression. FastTrack Schedule includes over 60 functions capable of complex calculations. FastTrack Schedule's functions operate just like those of other popular spreadsheet applications.

Notes:

- Text strings are placed in quotations
- The NullNum() function can be used to return a blank result when calculating numbers or dates
- An open quotation followed by a closed quotation without spacing can represent 'Null Text'
- Use the Function Reference button at the bottom of the Format Calculation dialog box to view function descriptions, syntax, examples, and more



Defining a Calculation

Defining a calculation column allows you to create a column that uses column references, text strings, numbers, functions, and operators to determine its value. For instance, you could create a column that displays text to display if an activity is has a cost greater than its given budget. This calculation may look like:

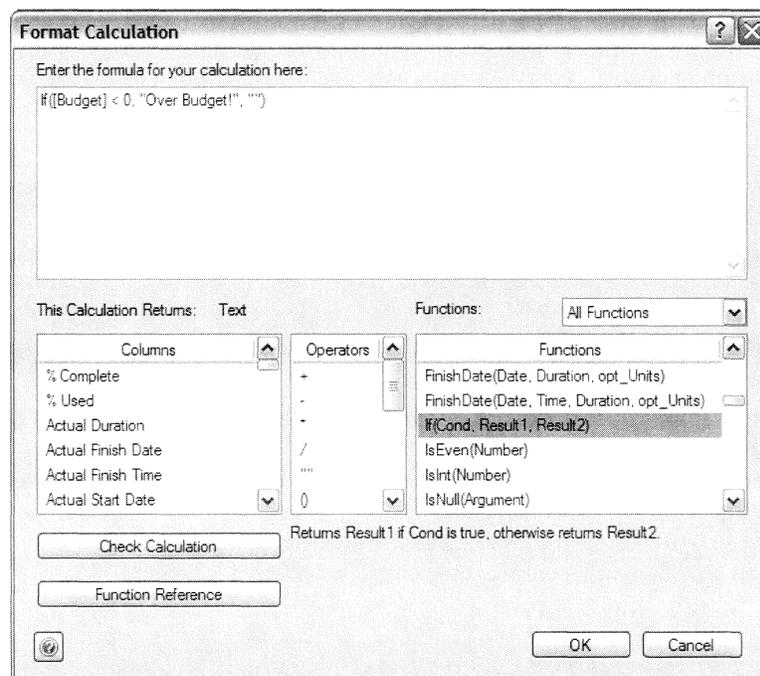
If([Budget] - [Total Cost] < 0, "Over Budget!", "")

To define a calculation column:

1. From the Insert menu, select Column.
The Insert Column dialog opens.
2. From the Show pull down list, select Calculation to show every available column of the type "Calculation".
3. In the Column Display Name table, click to select the name of the next available calculation column.
4. Click OK to insert the new column and close the Insert Column dialog.
The Format Calculation dialog opens.
5. In the Format Calculation dialog, use the Columns, Operators, and Functions tables below to enter a calculation.
6. Click OK to apply your changes and close the Format Calculation dialog.
The calculation column now appears in the schedule.

Entering a calculation

Entering a calculation defines the expression that is being evaluated to return a value for the calculation column.





To enter a calculation in the Format Calculation dialog:

1. Insert menu > Column > Calculation.
2. In the Format Calculation dialog, enter the calculation as described below.

To do this:	Do this:
Enter a column reference	In the field at the top of the dialog, click where you want to insert the column reference and then double-click the desired column name in the Columns table.
Enter an operator	In the field at the top of the dialog, click where you want to insert the operator and then double-click the desired symbol in the Operators table.
Enter a function	In the field at the top of the dialog, click where you want to insert the function and then double-click the desired function in the Functions table.
View specific functions	Click the pop-up list above the Functions table and select to sort the functions by name or category, or select to search the table for functions of a specific category.
Enter a literal text string	In the field at the top of the dialog, click where you want to insert the text string, enter quotes, and enter the text between the quotes. Values in quotations are interpreted literally by FastTrack Schedule. The characters enclosed in quotation marks appear in the return value exactly as they appear in the calculation.
Enter a number	In the field at the top of the dialog, click where you want to insert the number and then enter the number.
See a description of an element	Single-click an element from the Columns, Operators, or Functions table and read the description below the Functions table. Click the Function Reference button to open the help system to a detailed description of every function.

3. Click the Check Calculation button to evaluate the calculation and verify it is correct.
4. Click OK to apply your changes and close the Format Calculation dialog.

Notes:

- Column names must be contained in square brackets [] and must be spelled exactly as they appear in the Columns table.
- Only columns that store values per bar or resource can be used in a calculation (this is displayed or determined in the Options tab of the Format Column dialog).
- Functions cannot have a space between the function name and the opening parenthesis and must be spelled exactly as they appear in the Functions table.
- You may enter carriage returns in your calculation between elements.
- A calculation can provide a value only for the column for which it is defined.

Trainer's Tip:

- Use calculation columns in our example files for help.
- Use calculation columns to create Earned Value Analysis.
- Tie calculations with Filters or Summary Graphs to produce high-end reports.



MODULE 13

Summary Graphs



Module 13

Summary Graphs

Overview: Summary graphs summarize the values currently displayed in columns over a specified period of time. In this module, you will learn how to create and edit summary graphs and set them to display in layouts.

- a. Understanding and Inserting Summary Graphs
- b. Formatting Summary Graphs
- c. Summary Graphs in Layouts



Understanding and Inserting Summary Graphs

Summary graphs summarize the values currently displayed vertically in columns, horizontally over a period of time.

A summary graph appears as a row under the timeline graph, making it easy to match the summarized data to the corresponding time period. Six types of summary graphs can be created: Total, Average, Standard Deviation, Minimum, Maximum, and Count (including cumulative totals). There are three types of graphs: numeric, line graph, and histogram. These can be displayed in hundreds of different styles.

You can include more than one summary graph row in your schedule.

	Activity Name	November	December	January	February	Duration (Days)	Revised Duration (Days)	Original Estimate	Revised Estimate
71	Draw #2					0.0	0.0	\$0	\$0
72	Finish Selections					10.0	10.0	\$0	\$0
73	Erect walls, floors, and roof					19.0	19.0	\$17,650	\$17,650
74	Roofing					6.0	6.0	\$3,200	\$3,200
75	Window Systems					11.0	11.0	\$18,000	\$18,000
76	▼ Exterior wall surfaces					17.0	17.0	\$11,450	\$11,450
77	Brick and vinyl siding					13.0	13.0	\$8,600	\$8,600
78	Exterior trim					4.0	4.0	\$2,850	\$2,850
79	Draw #3					0.0	0.0	\$0	\$0
80	► Rough-in ductwork, plumbing, and electrical					7.4	7.4	\$4,900	\$4,900
85	Close-in Inspection					0.0	0.0	\$0	\$0
	Original Estimate	\$72,429	\$71,058	\$98,701	\$56,522	Original Estimate			
	Revised Estimate	\$86,663	\$71,058	\$98,701	\$56,522	Revised Estimate			
	Variance of Original vs. Revised	(\$15,029)	\$0	\$0	\$0	Variance of Original vs. Revised			
		November	December	January	February	T: 479.4	Tot: 484.4	\$564,907	\$601,857

You can also choose to have more than one set of summarized data display in the same way or in different ways, within a single summary graph row. For instance, you can have a line graph displaying the Total and a histogram displaying the Count in the same row. Though you can summarize more than one set of data in a given summary graph row, summarizing too much data in one row can be confusing, so organize your display accordingly.

Summary graphs are displayed in some pre-defined layouts. You can edit a pre-defined layout if it does not display summary graphs and you would like them to. You can also define new layouts that display them.



Showing and hiding summary graph rows

Showing summary graphs adds an area below the timeline graph that displays the total, average, standard deviation, minimum, maximum, and/or count of the values currently displayed in columns for a particular period of time. For instance, you could show a summary graph row that displays the total cost of all activities per week.

To show and hide summary graphs:

1. Go to the Project menu > Layouts > Define.
The Layouts dialog opens with the current layout selected.
2. Select the name of the layout you wish to change.
3. Click the Edit button.
4. In the Define Layout dialog, click the Summary Graphs tab.
Any summary graphs you have created appear in the Available Rows table.
5. From the Available Rows or Shown Rows table, select the summary graph you wish to hide or show.
6. Click the Hide or Show button to select if the summary graph should be displayed.
7. Click OK to save the layout and close the Define Layout dialog.
8. Click OK to apply your changes and close the Layouts dialog.

Inserting new summary graphs

If you want to create a new summary graph based on data in columns you have recently entered, you can create them using the Insert menu.

To insert summary graphs:

1. From the Insert menu, select Summary Graph.
The Format Summary Graph dialog opens.
2. Select the Summary Units you would like to calculate.
3. Type the name of the summary graph in the Left Label field.
4. Follow the instructions below to format the rest of the Summary Graph.

Notes:

When you show a summary graph row, it defaults to displaying the total Scheduled Duration per week. You can change the information in summary graph rows by formatting them. The Format Summary Graphs dialog opens when you double-click inside of a summary graph row.



Formatting Summary Graphs

Opening the Format Summary Graph dialog allows you to select the units, the data summarized, the type of summary operation, and the display of information for the selected summary graph row.

Data to Summarize	Summary Operation	Display As	Show Labels
Original Estimate	Total	Histogram	<input checked="" type="checkbox"/>

To open the Format Summary Graphs dialog

1. Click the summary graph row you want to format to select it.
 2. Go to Format menu > Summary Graph.
- or-
- Double-click the summary graph row.

Choosing units for summary graph rows

Choosing units for a summary graph row allows you to determine the unit of time (days, weeks, months, etc.) upon which the summary graph row bases its summaries.

To change the units of the summary graph row

1. Double-click the summary graph row you want to format to select it.
The Format Summary Graphs dialog opens.
2. Use the Summary Units value list to select a unit of time.
3. Click OK to apply your changes and close the Format Summary Graphs dialog.

Notes:

Always confirm that the summary operation is what you want. At times, you may inadvertently change this in the beginning and not realize it until after you have printed a schedule.



Choosing data to summarize in summary graph rows

Choosing the data to summarize in a summary graph defines what information is summarized per unit of time. For example, you could choose to summarize the Duration column, the Start Date column, or both columns.

To select data to summarize in the summary graph row:

1. Double-click the summary graph row you want to format to select it.
The Format Summary Graphs dialog opens.
2. From the Data to Summarize column in the table, select the column to summarize.
3. Select whether or not to summarize All Bar Styles.
4. If you choose not to summarize all bar styles, from the Bar Style to Summarize value list, select one particular bar style in which to summarize data.
5. Choose whether you wish to distribute the custom column data by Schedule, Revised, or Actual Duration.
6. Click OK to close the Format Summary Graphs dialog.

Choosing summary operations for summary graph rows

Choosing a summary operation for a summary graph row defines which of the following operations the row displays: the total, average, standard deviation, minimum, maximum, or count of activity bar values.

A cumulative summary is calculated in the same manner as a non-cumulative summary; however, the result of each time period is added to previous values. Thus, the values accumulate from time period to time period.

To select a summary operation for a summary graph row:

1. Double-click the summary graph row you want to format to select it.
The Format Summary Graphs dialog opens.
2. From the Summary Operation value list, select an operation.
3. If the operation will or can be tallied cumulatively, use the Cumulative checkbox to establish whether values before the start of the timeline will be included in the calculation of cumulative summaries.
4. If the operation will or can be tallied cumulatively, select to include or to ignore values for activities that occur before the schedule start in your summary.
5. Click OK to close the Format Summary Graphs dialog.

Notes:

Only columns which store values per bar can be summarized in a summary graph row.

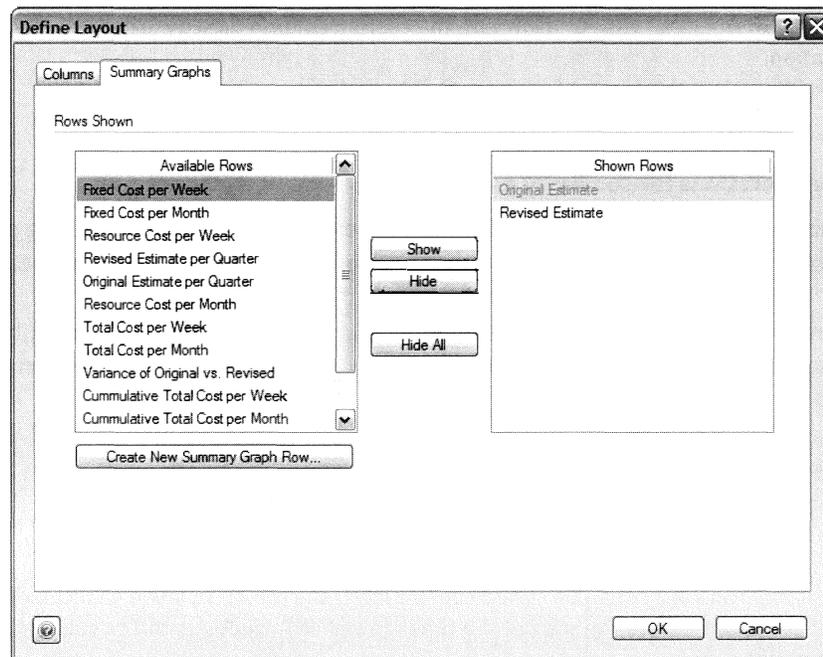


Summary Graphs in Layouts

Defining a layout allows you to create and edit what columns and summary graphs you view in the Schedule and Resource Views. Layouts are created and edited in the Layouts and Define Layout dialogs.

To open the Define Layout dialog:

1. Go to Project menu > Layouts > Define.
The Layouts dialog opens.
2. Click the Edit button to edit the existing layout you select from the Layouts table.
The Define Layout dialog opens.



To display summary graphs

1. Click the Summary Graphs tab of the Define Layout dialog.
Any summary graph you have created appears in the Available Rows table.
2. Click Show to send the selected summary graph to the Shown Rows table.
3. If you wish, click and drag on summary graph row names in the Shown Rows table to change the order of rows in the layout.
-or-
2. Click the Create New Summary Graph Row button to create a new summary graph and open the Format Summary Graph dialog.



MODULE 14
FastSteps



Module 14

FastSteps

Overview: FastSteps are macros with saved repetitive steps. In this module, you will learn how to create FastSteps and save time when building client reports, setting up status meeting printouts, and auto-exporting updated graphics.

- a. Review of Ranges, Layouts & Filters
- b. FastSteps Overview
- c. Creating FastSteps
- d. Working with FastSteps



Review of Ranges, Layouts & Filters

Ranges

Ranges are a saved span of dates. They can be changed at any time to determine what days you see in the schedule timeline and the calendar. You can access them easily from either the Ranges Toolbar or the Ranges submenu of the Project menu. Ranges can be applied to each View or all Views at once.

The Master Range is designed to give you a quick way to return your file to a user-defined default range. Each file has a unique Master Range. When you apply the Master Range it is applied to every View in the current file. It can be changed at any time, in any View, to change the data shown in the schedule timeline or calendar.

Layouts

Layouts are different groupings of columns. They are convenient because you can change between them quickly and easily. Layouts are available in the Schedule and Resource Views. Layouts show, hide, and move columns, the timeline graph, Action Columns, timescale areas, and summary graphs.

Filters

Filtering uses search criteria that you define to identify information in rows, activity bars and resource rows. It then allows you to apply filters to the Schedule, Resource, and Calendar Views to hide or select activities or resources that match the criteria. Because the Calendar View uses the same data as the Schedule View, filters created in the Calendar View are applicable in the Schedule View or vice versa. Filters created in the Schedule View or Calendar View, however, are not applicable to the Resource View or vice versa.

Tip:

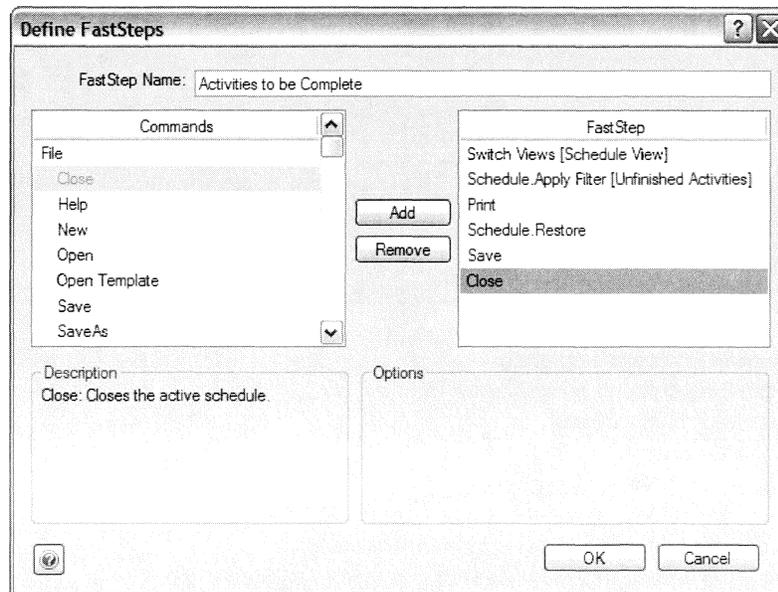
Layouts and Filters are discussed in detail in Module 5 – Reporting (Layouts & Filters)



FastSteps Overview

FastSteps is a scripting ability, built into FastTrack Schedule. FastSteps allow you to automate repetitive scheduling tasks by grouping a series of commands into a single sequence that you can then initiate with one menu choice. FastSteps are available in the Schedule, Resource, and Calendar Views and their Print Preview windows.

Let's say, for instance, that every time you update a particular file, you want a report of the activities that remain unfinished. Using FastSteps, you can create a sequence that applies a filter for incomplete activities, prints the filtered schedule, restores those activities hidden by the filter, saves the application, and then closes that schedule. The graphic below illustrates the FastSteps command sequence detailed above. It is named "Activities to be Completed".



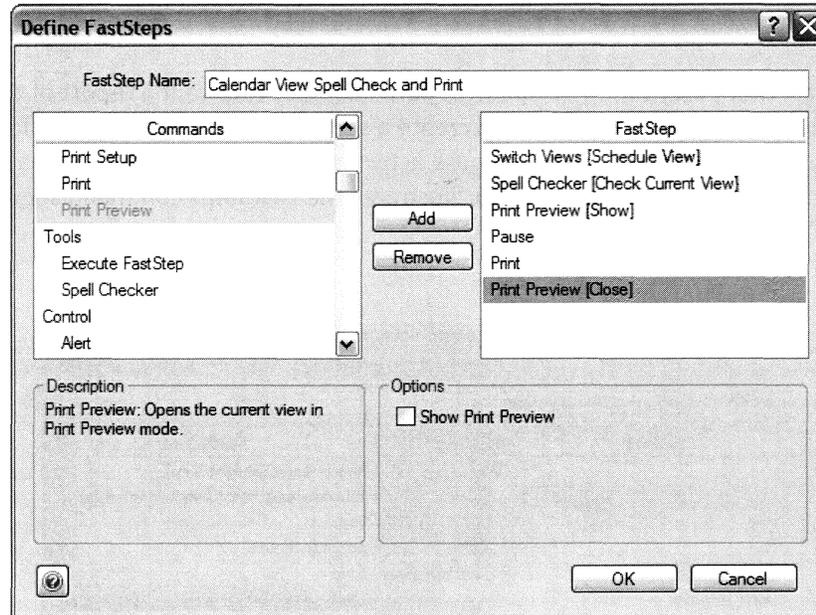
Every time you finish editing the schedule, you simply select "Activities to be Completed" from the FastSteps Toolbar and all of the commands listed above will be completed automatically.

Each member of a project team can have a FastSteps sequence to suit his or her needs. You could also create different sequences for every version of the schedule you would like to print, thus creating reports. There is no limit to the number of uses you can find for this powerful tool.



Creating FastSteps

FastSteps allow you to string a collection of commands together into one FastSteps script that can be run with one menu choice.



To create a new FastSteps sequence:

1. Go to the Project menu > FastSteps > Define.
The FastSteps dialog opens.
2. Click the New button.
The Define FastSteps dialog opens.
3. In the FastStep Name box, enter a name for the FastStep.
4. Select desired command in the Commands table.
5. Click the Add button to send the command to the FastStep table.
6. Continue inserting commands into the FastStep table until you have the sequence of commands you desire.
7. Drag commands up and down in the FastStep table to change the order in which the commands occur.
8. Click OK to apply your change and close the Define FastSteps dialog.
9. Click OK to apply the FastStep and close the FastSteps dialog.
-or-
Click Close to exit FastSteps without running a FastSteps sequence.
Your newly created FastStep is saved; you simply select the sequence name from the FastSteps submenu or FastSteps Toolbar when you are ready to run it.

Notes:

By selecting the Pause command, you can add a pause to your script. This will pause the FastStep and bring up a dialog displaying a message you define. Then, in the Pause dialog, you can click the Resume button to start the FastSteps script where it left off, or you can click the Stop button to abort the sequence.



Working with FastSteps

Editing an existing FastSteps sequence

An existing FastSteps sequence can easily be altered to suit your changing needs.

To edit an existing FastSteps sequence:

1. Go to Project menu > FastSteps > Define.
The FastSteps dialog opens.
2. From the table, select the FastSteps sequence you would like to edit.
3. Click the Edit button.
The Define FastSteps dialog opens.
4. If necessary, click in the FastStep Name box to edit the title of the FastSteps sequence.
5. Click the Add and Remove buttons to alter the commands in the FastStep table.
6. Drag commands up and down in the FastStep table to change the order in which the commands occur.
7. Click OK to apply your changes and close the Define FastSteps dialog.
8. Click OK to apply the FastStep and close the FastSteps dialog.
-or-
Click Close to exit FastSteps without running a FastSteps sequence.
Your changes to the FastStep are saved; you simply select the sequence name from the FastSteps submenu or FastSteps Toolbar when you are ready to run it.

Running an existing FastSteps sequence

Once you have created a FastSteps script you can run it at any time you are working on a schedule. Keep in mind, however, that changes to filters, sorts, layouts, and ranges will affect any FastSteps that include them.

To run an existing FastSteps sequence:

1. Go to Project > FastSteps > select the FastStep you wish to run.

Notes:

If a FastSteps script is unable to run, the Define FastSteps dialog opens with the command that does not work highlighted. Most likely, the FastStep contains a filter, sort, layout, or range that has been deleted or renamed.



MODULE 15
Templates



Module 15

Templates

Overview: In this module, you will learn how to save your schedule as a template to quickly create future, similar schedules.

- a. Using Templates
- b. Template Options



Using Templates

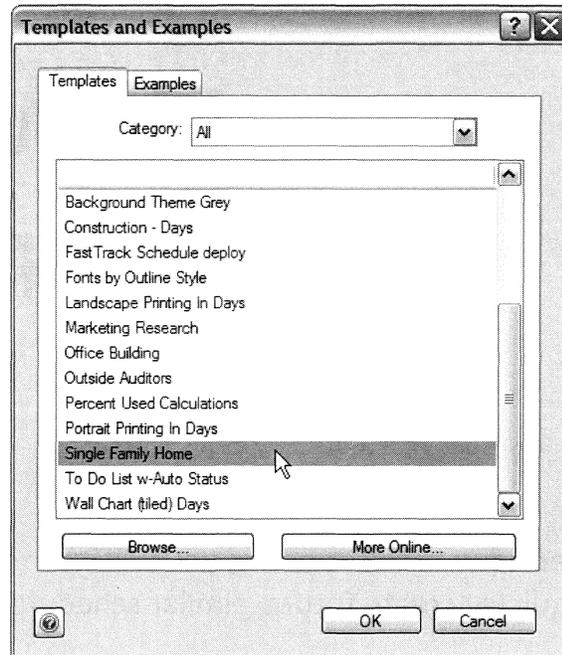
Once you have completely customized your file, you can save it as a template so that it can be used in the future for new projects.

To save a file as a template:

1. Go to the File menu > Save As Template
2. Type a name for the template and click OK

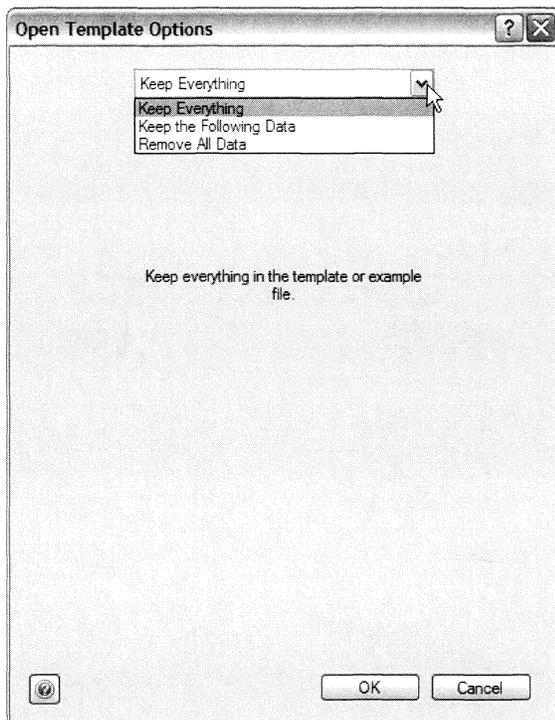
To create a new schedule using your template:

1. Open FastTrack Schedule
2. Go to the File menu > New (Getting Started screen appears)
3. Select 'New Schedule from Template'
4. In the Templates tab, choose the template and click OK



You will be presented with Open Template Options.

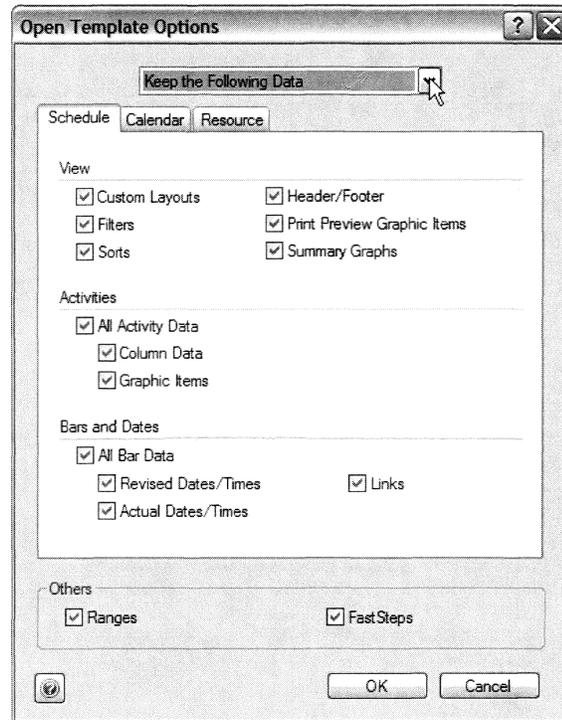
Template Options



Keep Everything will create an untitled schedule file identical to the template file you chose. Use this option if your projects are very similar and only a few changes need to be made to transform it into a schedule for a new project.



Keep the Following Data will present you with all parts of the template. You can then select which parts of the template you want to keep. For example, if your project activities are different from one another but you want to keep your Header/Footer settings the same across projects, deselect 'All Activity Data'. When a new schedule is created, no activities will be present but other items that you have kept selected will remain.



Remove All Data will remove all data from the template but keep formatting within the schedule. Formatting includes fonts that are applied in the columns and outline styles that have been defined.



MODULE 16

Consolidating Schedules



Module 16

Consolidating Schedules

Overview: In this module, you will learn how to easily consolidate your FastTrack Schedule files into one master file to analyze a big picture view of all of your data.

- a. What is Consolidation?
- b. How to Consolidate
- c. Schedule View
- d. Resource View



What is Consolidation?

You can easily consolidate your FastTrack Schedule files into one master file to analyze a big picture view of your data. Whether you want to see all the separate components of one larger project, or see every project your company is currently working on, Consolidation allows you to do so. Consolidation works across platforms so consolidated files can originate from either a Mac or Windows operating system.

Master file - the file you create by consolidating existing files is called a master file. A master file can never be inserted into another file or into itself.

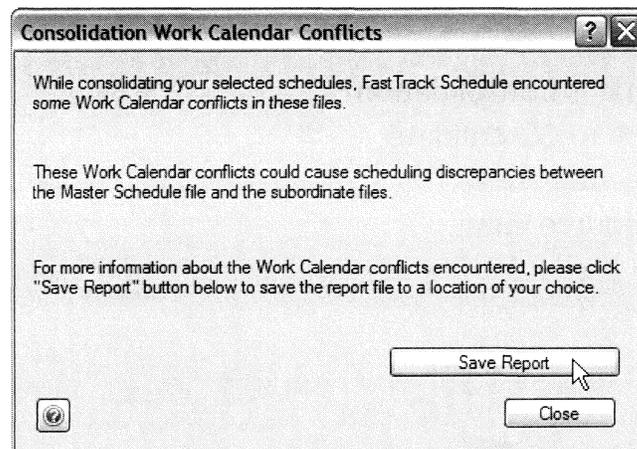
Subordinate file - a file that is inserted into a master file is called a subordinate file.

Subordinate files must be accessible, either on the hard drive or by network, and openable. The master file's user must have read access to a file to insert it.

Important:

Consolidated subordinate files are not live. There are no automatic updates. When data changes in a subordinate file, the changes do not appear in the master file until changes are saved in the subordinate file and you choose to refresh the data from that subordinate file in the master file. Changes you make to data in the master file must be manually applied to the appropriate subordinate files.

When subordinate files with different project calendars are consolidated, FastTrack Schedule will produce a report with the differences across all the project calendars.



Changes to data in the master file are for analysis only and do not affect the subordinate file. If you decide that you want to apply changes you have made in a master file, you must open the appropriate subordinate files and manually make the changes there.

Consolidation is data driven, not visual. Formatting related information will not be consolidated. Formatting is originally determined by the master file's preference settings. You can edit Filter, Sort, Layout, Range, FastSteps and format settings in the master file, but the changes will not be applied to the subordinate file unless you manually apply them.

Trainer's Tip:

Consolidated master files are great for team meetings and "what if" scenarios.

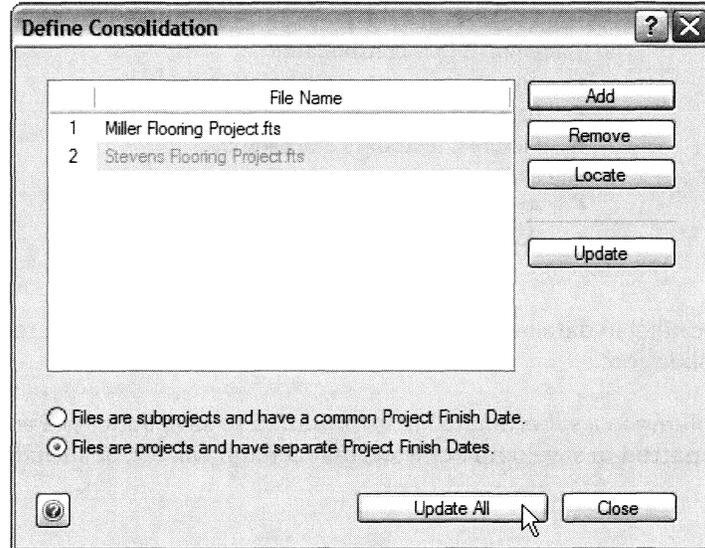


How to Consolidate

You can create a master file by inserting any accessible FastTrack Schedule file into an open FastTrack Schedule file.

To insert one project into the master file:

1. Go to File > Consolidate > Define. The Define Consolidation dialog opens.
2. Use the options described below to consolidate files.



This option:	Does this:
Add	Allows you to navigate to a file you want to insert into the master file.
Remove	Removes a file from the table. That file will no longer be inserted into the master file or updated. The Removed file will then be removed from the master file though it had been inserted previously.
Locate	Opens a navigation window showing the path of the selected subordinate file. If you have copies of the same file in different locations, Locate allows you to be sure you are consolidating the correct copy.
"Files are subproject..." option	Every subordinate file in the master file will share the same Project Finish Date and Time, those of the master file.
"Files are project..." option	Every subordinate file in the master file will maintain its own Project Finish Date and Time.
Update	Inserts the most recent saved version of the selected file.
Update All	Selects and updates every file in the dialog and closes the dialog.
Close	Closes the dialog.



Schedule View

Projects that have been consolidated will display a file icon  in the Schedule View information action column. To get information on the consolidated project double click on the file icon.

The following data is consolidated:

- All columns – except calculation columns
- Bars and bar styles
- Pictures, textboxes and legends
- Links
- Assignments
- Pointers

Any conflict in data between a subordinate and the master file results in that data being excluded from consolidation.

If a column in a subordinate file is formatted to save data Per Bar and the same column in the master file is formatted to save data Per Row, that column will not be included in the consolidation.

Resource View

Resources are consolidated in the master file. In the Resource View of the master file, you can see if the consolidated resources are over allocated.

Resources do not get deleted from the master file even if future updates of the subordinate file in which the resource originated no longer include that resource.

You can consolidate subordinate files that have different Resource Work Calendars defined for the same resource.

The following data is consolidated:

- All columns – except calculation columns
- Bars and bar styles
- Assignments

Any conflict in data between a subordinate and the master file results in that data being excluded from consolidation.